A Database Publication

ATARI USER

Vol. 4 No. 5 September 1988 £1.25



TYPE-IN GAME
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UTILITIES
Catalogue your discs
Personalise your printing



What's new in the USA



INSIDE THE VCS 2600 GAMES SYSTEM

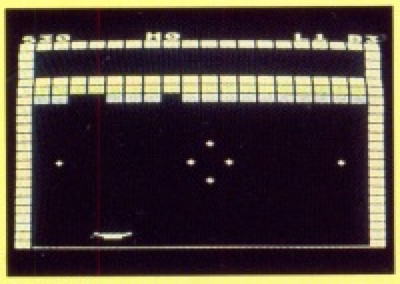
Special pull-out

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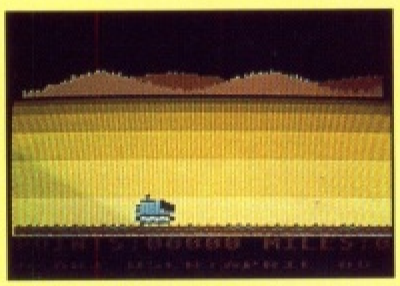
10 fabulous programs from your favourite Atari 8 bit magazine!

Due to the tremendous success of the last Ten of the Best compilation we have compiled a new disc full of the most exciting games that have appeared in *Atari User* over recent issues.

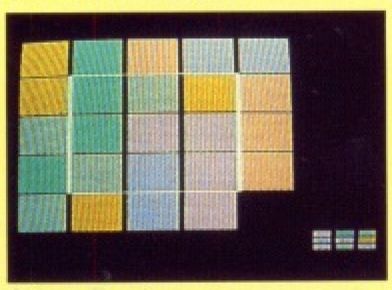
There are stunning shoot-'em-ups, challenging simulations and thought provoking strategy games alike – and all for only . . .


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Tyrants of Torment


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Colour Puzzle

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Colour Puzzle – A mind-boggling brain teaser devised to confuse and bewilder. Match the coloured squares in this version of the traditional sliding block puzzle.

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Clay Pigeon Shooting – Test your accuracy in our fast-action shooting game. How many birds can you bag today?

Brag – Saloon gambling in the Wild West as you take on three of the meanest card players this side of Dodge City. There may be more at stake than just cards.

TO ORDER PLEASE USE THE FORM ON PAGE 47



Vol. 4. No. 5 September 1988

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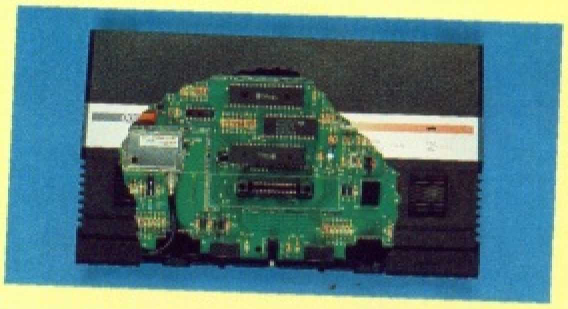
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"Atari User" welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication by Database Publications Ltd will be on an all-rights basis.

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Get it right! II

All major listings in this issue are accompanied by checksums to help overcome typing mistakes. For full details of how they work, see the article on page 23 of our November 1987 issue.

Gallup Software Chart

THIS MONTH	LAST MONTH	TITLE (Software House)	COMMENTS	PRICE
1	1	**GRAND PRIX SIMULATOR** *Code Masters*	The ultimate in simulators stays at the front of the field. This can be played again and again.	1.99
2	2	**GREAT AMERICAN ROAD RACE** *Firebird*	Ten drivers await you in this race crossing the USA. Beware of the police, your speed and the obstacles.	1.99
3	●	**DAYLIGHT ROBBERY** *Atlantis*	From the same stable as Cops 'n' Robbers – a fun, value for money romp on the wrong side of the law.	1.99
4	●	**LEAPSTER** *Alternative*	Great if you enjoy jumping over cars and lorries while collecting items from open windows.	1.99
5	15	**AIR WOLF** *Encore*	Translated from the TV programme. You are a man with a mission flying a helicopter.	1.99
6	13	**STEVE DAVIS SNOOKER** *Blue Ribbon*	Re-released to coincide with the last snooker championships; good for its genre and hasn't dated.	1.99
7	9	**ZYBEX** *Zeppelin*	An excellent shoot-'em-up, worth more than its budget price. Good graphics.	2.99
8	5	**SPEED ACE** *Zeppelin*	Zeppelin's first release for the Atari. Good use of the split screen in this motorbike simulation.	2.99
9	●	**POTHOLE PETE** *Atlantis*	Good price and clean graphics in this adaptation of a common platform game.	1.99
10	20	**BMX SIMULATOR** *Code Masters*	Code Masters is renowned for its simulations. This one is no exception with nice graphics and sound.	1.99
11	●	**DESMOND'S DUNGEONS** *Alternative*	Join this little fellow as he struggles to gain points, wealth and safety. Platform games are in this month.	1.99
12	●	**EXTIRPATOR** *Firebird*	Another release from the British Telecom budget label. No complaints at the price.	1.99
13	●	**LEADERBOARD** *US Gold*	Making a comeback – so if you missed out at St Anne's cross the Atlantic for this golfing spectacular.	9.95
14	●	**BOULDERDASH** *Prism*	Your chance to play the diamond chasing, rock-eating fiend. Add it to your collection if you haven't already.	2.99
15	●	**FOUR GREAT GAMES** *Micro Value*	Superb value especially as it includes Phantom and Rebound. Not one to be missed.	3.99
16	19	**HENRY'S HOUSE** *Mastertronic*	If you haven't already got this platform game add it to your collection; stunning graphics.	1.99
17	10	**REVENGE 2** *Masterstronic*	Geff Minter's long-awaited sequel to Revenge of the Mutant Camels. As strange as ever.	1.99
18	9	**SPOOKY CASTLE** *Atlantis*	This one starts difficult to play and rapidly becomes impossible as Gormless Gary avoids the bats.	1.99
19	7	**DECATHLON** *Firebird*	Exercise without leaving your chair with multiple events to choose from in your quest to head the field.	1.99
20	4	**MATTA BLATTA** *Firebird*	Fallen from last month, but Firebird is holding its own in the market with four games in the chart.	1.99

Now try before you buy

HERE'S a sneak preview of what you'll see when the new Atari Games Centres begin to open up throughout the country.

Atari plans to set up between 30 and 40 such centres – based on retail outlets located in Britain's biggest cities and towns – where games players can try out the latest releases for themselves before deciding what to buy.



Legend comes to life

A BLOCKBUSTER illustrated adventure game based on the legend of King Arthur is shortly to be unveiled by Level 9.

Lancelot is the second title to be released by the specialist software house under the exclusive Mandarin label, the first being the Time & Magik trilogy.

The game closely follows Malory's Le Morte D'Arthur, and traces the legend of King Arthur from the founding of the Round Table through to the successful conclusion of the search for the Holy Grail.

Pete Austin of Level 9, himself an authority on King Arthur, insists that this is "the best game to date" from the company that is the acknowledged world leader in adventure software.

"The legends of King Arthur and his Knights of the Round Table are known to all", says Pete, "but it is a sad fact that most modern interpretations seem to owe nothing to the original tales.

"Most people will have seen software programs with Arthurian titles which turn out to involve Merlin jumping from platform to platform while zapping orcs with fireball spells.

"We got tired of waiting for someone else to do a proper job, so here's our faithful interpretation of the Arthurian saga".

The package contains three adventures, with more than 60,000 words of text interspersed with high quality graphics. Price £14.95.

ATARI PLANNING ST CONVERSIONS

FRESH waves of 8 bit entertainment software will soon be pouring into the shops as a result of new Atari initiatives.

At least six games among a batch under development at Atari UK headquarters are very near to completion, the company's software chief, Bab Katz, told *Atari User*.

And a licensing agreement with a leading software games publisher has guaranteed a further supply of titles in the New Year.

The deal will result in at least 20 programs being ported across from the ST.

The new titles – on the Atari label – will initially be released for the XE with 2600 versions to come later.

The ST conversions will run right across the board – XE, 2600 and 7800. "These should be ready for release at the start of next year", Katz said.

"I can't give you details of the deal just yet except to say that a major publisher is involved. "But I can promise that some of the titles involved are very big games".

New graphics system

CHICAGO based Reeve Software (0101 312 393 2317) is promising to open up a whole new world for Atari XL/XE users with the release of Diamond – a complete graphics operating system.

An environment rather than a program, it allows the Atari to use the icon-based point-and-click menu systems that ST owners already have at their fingertips.

Features include a mouse cursor that can be operated by keyboard, joystick, touch tablet or mouse, drop-down menus and desk accessories which can be called up from any Diamond-based program at any time.

Icons can be activated through a point-and-click system with a mouse, then shaped or moved. Dialogue boxes and windows are also easily manipulated.

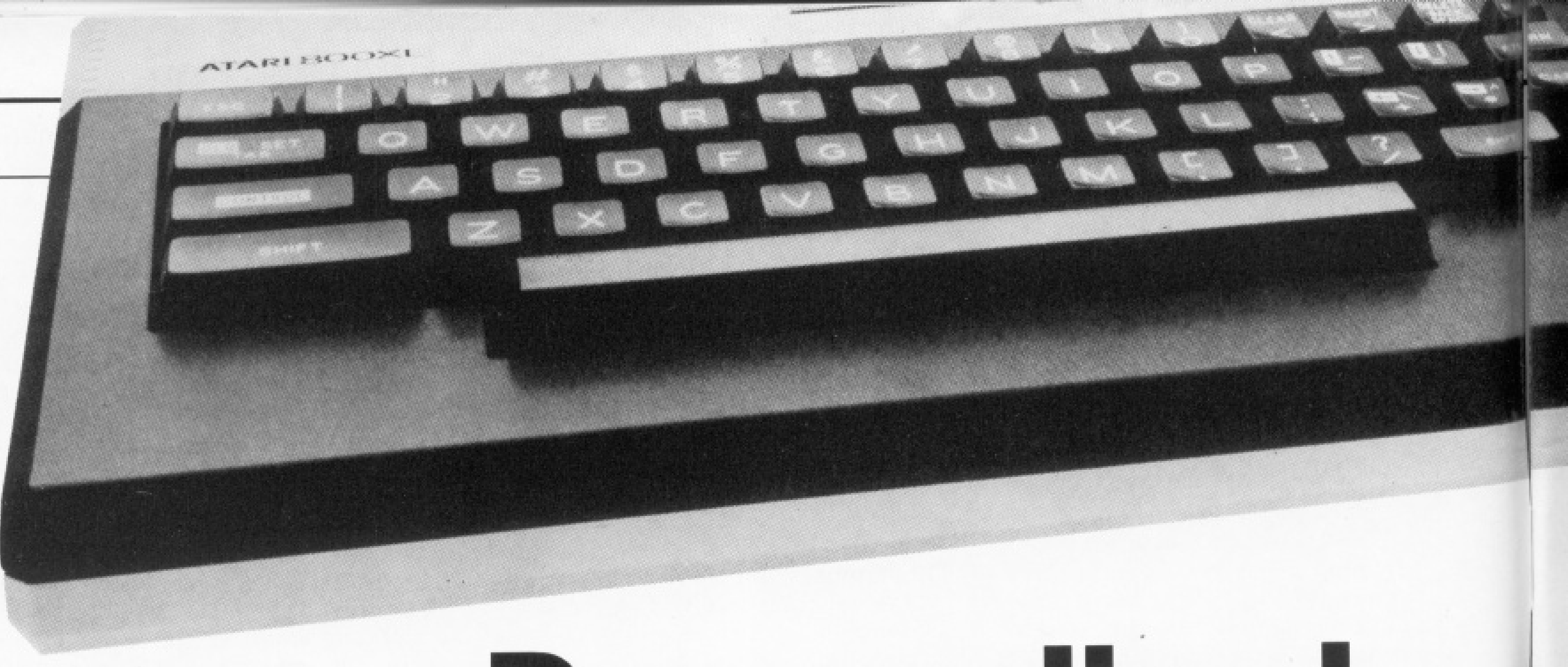
The package includes Diamond Desktop Software which is designed to keep keyboard use to a minimum. Desktop is compatible with floppies, hard drives and ram discs as well as with most disc operating systems. Price $29.95.



INGRID IS BACK...

THE sequel to the successful Gnome Ranger from Level 9, Ingrid's Back is on schedule for release in October.

It features the same accident-prone heroine as the original. This time she's tasked with thwarting Jasper Quickbuck, insider-dealing lord of Ridley's Manor who's planning to steamroll the gnome belt for a Yuppie Homes development. Price £14.95 on tape, £19.95 on disc.



Personalised printing need not be a pain

LEN GOLDING's new routine takes the toil out of creating your own characters

MOST modern Epson and compatible dot matrix printers have a download capability which allows you to replace the standard characters with ones of your own design. You could go Gothic for example, or produce a sans serif font similar to school script.

You could also design special purpose characters, such as Ordnance Survey or electronics symbols, or draw your own dungeon floor plans complete with traps and treasures. Another idea is to define icons – men, cars, ships and so on – so that complex statistical data can be presented in pictorial form.

Understanding how to do it though – well that's another matter entirely. Printer manuals are notoriously unfriendly, especially when they're written in Japanese English. Epson manuals are better than most, but it still takes a lot of time, effort and background knowledge to get the download system working, especially since none of the sample programs will run correctly in Atari Basic.

Even when you've managed to decipher the instructions and are aware of all the strict rules on syntax and character shape limitations, the job's only just begun. You're still faced with a tedious and error-prone task involving many binary-to-decimal conversions. And the shape you produce on the drawing board may bear little relation to the character printed.

Also different print modes – enlarged, condensed, emphasised and so on – can change the appearance of a character, so you really need to see it in all modes before finalising its shape.

This utility program overcomes all of the fundamental problems. It makes character designing as easy as playing a computer game and the results can be printed out in various modes as part of the editing process. When you're satisfied, the character data can be inserted into a short Basic program which will do the downloading for you and can easily be incorporated into your own software. The new characters will then remain available until you switch the printer off.

Before we examine the Editor – Program II – in detail, let's look at some of the principles involved. If your printer can download new characters it possesses two independent memories – rom and ram. The rom contains the standard character shapes or fonts, which the printer normally uses. Like the rom inside your computer, its contents cannot be changed.

The printer's ram, on the other hand, is easily modified. Most printers use this chunk of memory as a print buffer – text is loaded into it at high speed, then released one character at a time at a rate the printer can handle. As soon as your text has finished loading into the buffer the computer can be used for other things, even though the printer may still be chattering away.

To download a new set of characters you must first take control of the buffer ram. Usually this involves setting one or more DIP switches inside the printer – your manual will refer to *disabling* the buffer, or making it *invalid*.

Once the new switch pattern has been set the printer will be able to store only one or two lines of text in advance, so you won't be able to use the computer until virtually all the file has been printed.

The other thing to remember is that downloaded characters of this kind will not work in NLQ modes. However, you can use them in all other styles – pica, elite, enlarged, condensed, subscript and so on.

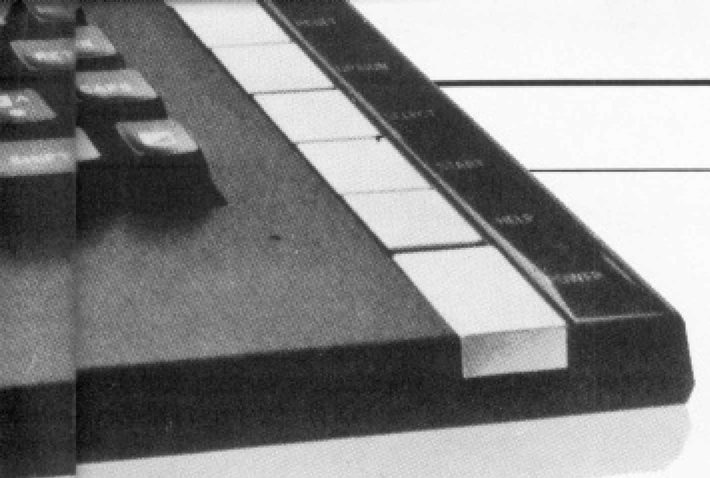
Usually you will want to change only a few characters rather than installing an entire font. This is a three-stage process: First you copy the standard character set from rom to ram, next download all the new *shape* data and finally tell the printer to use the ram character set instead of its usual rom one.

The necessary instructions are sent in the form of Ascii strings always starting with CHR$(27) – the Escape code. The printer recognises these strings as instructions, not as text to be printed.

For example, the Ascii codes which will copy the entire character set from rom to ram are: 27,58,0,0,0. The Epson manual suggests this way of sending them to the printer:

```
10 LPRINT CHR$(27);":";CHR$(0);CHR$(0)
;CHR$(0)
```

Unfortunately, it won't work on the



Atari since the LPRINT command cannot handle semicolons in the right way. And semicolons are absolutely vital – leave one out or put it in the wrong place and your program won't work properly. To get round the problem, we have to use something like this:

```
10 OPEN #1,8,0,"P:"
20 PRINT #1; CHR$(27);":";CHR$(0);CHR$(
0);CHR$(0)
```

Program I illustrates the download system in practice. Line 20 copies the character set from rom into ram and line 30 tells the computer which characters are to be re-defined by indicating the first and last characters in the desired block.

The inverse 14 specifies all characters from inverse 1 – CHR$(177) – to inverse 4 – CHR$(180). If you want to re-define only a single character, this must be specifed as both the start and the end character in your block. For example, to re-define only the letter A, you would change line 30 to read:

```
30 PRINT #1;CHR$(127);"&";CHR$(fl);"AA";
```

or:

```
30 PRINT #1;CHR$(27);"&";CHR$(0);CHR$(
65);CHR$(65);
```

Almost any block of characters can be re-defined so long as you steer clear of the essential printer control codes: 7 to 27, 127, 135 to 155 and 255. It's most convenient to use the inverse character set, especially if you're designing an entire font. But there's nothing to stop you re-defining non-inverse characters – say by changing the *a* and *i* into school-script form, or putting a Copyright symbol on the *@* key.

Lines 40 to 100 in Program I send the new character data to the printer. You must provide exactly the right amount of data – twelve numbers a character – to replace everything in the specified block, otherwise you'll get peculiar results.

Line 110 instructs the printer to use the character set in ram instead of its usual rom set. Line 120 prints out the re-defined characters. When you Run Program I you will get a Greek letter *Mu*, the Ordnance Survey symbol for a church with spire, a small man and the circuit symbol for an NPN transistor.

Each character pattern is made up of 12 numbers, the first of which contains *attribute* data. This specifies whether or not a below-line descender is required – as in y or j.

You'll see it's 11 for *mu*, which has a descender and 139 for the other symbols which all sit above the baseline. If your character is to be used in proportional mode, this first number also contains the necessary size data.

Working out the attribute value can be a pain and, unless you know precisely what you're doing, it's best to steer clear of proportional characters. However, if you must use this mode the editor program will do the calculations for you, provided you obey the rules on character widths, which are laid down in your printer manual.

> ***'Printer manuals are notoriously unfriendly, especially when they are written in Japanese English'***

The remaining 11 numbers all specify shape data. They are treated as binary numbers and your printer manual should contain a diagram showing how they are translated into print-head patterns. You don't need to understand how it works though, because the editor will work out all the numbers for you.

Now let's look at the editor program itself. When you Run it, there is a delay of about five seconds while the machine code routines are initialised. Then you'll see a grid and a cross-shaped cursor displayed on screen.

Use a joystick to move the cursor and press the fire button to place dots where you want them, or to erase existing dots. The cursor can be speeded up or slowed down by increasing or decreasing the value of SPEED in line 10.

A dot can go in any cell or on any of the vertical lines, so the grid is in effect 11 columns wide by 8 rows high. However, because of the printer's internal limitations, you can't put a dot on a vertical line if either of the adjacent cells is occupied – and vice versa. If you try to position a dot illegally, the computer will refuse to do it and you'll get a polite beep.

At the bottom of the Edit screen you'll see a menu of options, any of which can be selected simply by typing the initial letter. **Erase** clears all dots from the grid. **Fill** puts a dot in every cell – but not on any lines. **Toggle** replaces every dot with a space and every space with a dot, creating an inverse image.

However, dots on lines will not toggle correctly so they are erased and only the dots in cells are inverted. This is to ensure you don't end up with an illegal pattern.

The **Convert** option presents you with a second menu, asking whether you want a descender and whether proportional data is to be included in the attribute byte. Once you've supplied the necessary information the twelve numbers describing your character will be worked out and printed on screen.

The **Print** option requires a selection from Menu II, but then it prints a third menu which allows you to specify the print mode – enlarged, condensed, emphasised and so on. When you have made your choice, the program will dump your new character to the printer – along with the twelve numbers describing it.

In fact, it prints the character several times so you can see how it looks on its own and in conjunction with other letters. Line 1100 controls the print-out and you can easily change it to suit yourself. After printing you get the chance to try the same character in a different mode without having to repeat the whole conversion process.

When any menu is displayed, pressing the Escape key will return you to the Edit mode, with the re-designed character intact. All the likely errors are trapped, the menu system makes it hard to crash the program – which is designed to be as user-friendly as possible.

When you're satisfied with your artistic efforts, the new character data can be inserted into Program I replacing or adding to the examples already there. Just make sure that you have exactly the right amount of data – 12 numbers a character – to replace everything in the specified block.

The new routine can now be incorporated into your own Basic software, so that the new characters are downloaded at the start of your program and can be used like the standard character set.

Turn to Page 8 ▶

◀ From Page 7

```
1 REM PROGRAM TO DEFINE AND PRINT FOUR
  NEW CHARACTERS
2 REM BY LEN GOLDING
3 REM (c)ATARI USER
4 REM ********************************
10 OPEN #1,8,0,"P:"
20 ? #1;CHR$(27);":";CHR$(0);CHR$(0);C
HR$(0);:REM copy ROM character set int
o RAM
30 ? #1;CHR$(27);"&";CHR$(0);"14";:REM
 Specify which characters are to be re
placed ("1" to "4")
40 READ D:IF D=-1 THEN 110
50 ? #1;CHR$(D);:GOTO 40:REM Download
new character shapes from lines 60-90
60 DATA 11,1,2,124,0,4,0,4,0,120,4,0
70 DATA 139,0,0,12,64,30,224,30,64,12,
0,0
80 DATA 139,8,16,1,38,152,96,152,38,1,
16,8
90 DATA 139,0,254,0,16,0,42,0,70,0,142
,0
100 DATA -1
110 ? #1;CHR$(27);"%";CHR$(1);CHR$(0);
:REM Select RAM character set
120 ? #1;"1 2 3 4":REM Print the four
new characters
```

Program I: Defines end prints four demonstration characters

Get it right!

LINE	CHSUM	LINE	CHSUM
1	CAJ (W)	50	VQR (G)
2	CAK (3)	60	U27 (2)
3	CAL (V)	70	WRC (U)
4	CAM (4)	80	4YJ (Q)
10	22R (Y)	90	VJ8 (5)
20	852 (E)	100	MSC (3)
30	YKG (T)	110	VMX (L)
40	GFK (6)	120	CLT (V)

```
1 REM PRINTER CHARACTER DESIGN AID
2 REM BY LEN GOLDING
3 REM (c)ATARI USER
4 REM ***************************
10 SPEED=20:BAK=0:BLOCK=202:LINE=40
20 DIM M(11):POKE 53248,0:POKE 82,1
30 GRAPHICS 0:? "Initialising...."
40 FOR X=0 TO 214:READ D:POKE 1536+X,D
:NEXT X
50 DATA 104,104,104,141,7,212,24,105,2
,133,204,133,206,169,0,133,203,133,205
.168
60 DATA 162,2,145,203,136,208,251,230,
204,202,208,246,169,100,141,254,6,169,
18,141
70 DATA 255,6,169,3,141,29,208,169,46.
141,47,2,169,14,141,192,2,208,1,104
80 DATA 173,254,6,208,4,141,0,208,96,1
73,120,2.201,15,240,109,173,255,6,24
90 DATA 105,5,168,162,5,169,0,145,205,
136,202.16,250,173,120,2,41,1.208,17
100 DATA 173,255,6,56,233,8,201,18,176
,2,169,18,141,255,6,208,22,173,120,2
110 DATA 41,2,208,15,173,255,6,24,105,
8,201,74,144,2,169,74,141,255,6,173
120 DATA 120,2,41,4,208,17,173,254,6,5
6,233,4,201,100,176,2,169,100,141,254
130 DATA 6,208,22,173,120,2,41,8,208,1
5,173,254,6,24,105,4,201,140,144,2
140 DATA 169,140,141,254,6,172,255,6,1
69,32,145,205,200,145,205,200,169,248,
145,205
150 DATA 200,169,32,145,205,200,145,20
5,173,254,6,141,0,208,96
160 POKE 53248,0:S=PEEK(106)-16:POKE 1
06,S-16
170 GRAPHICS 7:POKE 708,LINE:POKE 709,
BLOCK:POKE 710,BAK:POKE 712,BAK
180 POKE 623,1:POKE 752,1:? "Still ini
tialising..."
190 COLOR 3:GOSUB 600:REM Draw grid
200 X=USR(1536,S):REM Set up PM graphi
cs
210 POKE 764,255:? "K":? "Erase  Fill
 Toggle  Convert  Print"
220 K=PEEK(764):IF K=255 THEN 300
230 POKE 764,255
240 IF K=42 THEN ? "KERASE...":COLOR 3
:GOSUB 600:GOTO 210
250 IF K=56 THEN ? "KFILL...":COLOR 2:
GOSUB 600:GOTO 210
260 IF K=45 THEN ? "KTOGGLE...":GOSUB
430:GOTO 210
270 IF K=18 THEN ? "KCONVERT...":GOSUB
 680:IF OK=1 THEN GOSUB 1140:GOTO 210
280 IF K=10 THEN ? "KPRINT...":GOSUB 6
60:IF OK=1 THEN GOSUB 950:GOTO 210
290 POKE 764,255:GOTO 210
300 POKE 53278,0:X=USR(1595):REM Main
 joystick control routine
310 H=PEEK(1790):V=PEEK(1791)
320 T=0:IF (H-96)/8=INT((H-96)/8) THEN
 T=1
330 FOR W=1 TO SPEED:NEXT W
340 IF STRIG(0)=1 THEN 220
350 PMODE=PEEK(53252):IF PMODE=3 OR PM
ODE=6 OR PMODE=7 THEN GOSUB 1220:GOTO
220
360 X=H-49:Y=V-17:LOCATE X+1,Y+1,Q
370 Z=3*(Q=2)+2*(Q=3)
380 COLOR Z:FOR ROW=Y TO Y+6
390 PLOT X,ROW:DRAWTO X+6,ROW:NEXT ROW
400 IF Z=3 AND T=1 THEN COLOR 1:PLOT H
-46,V-17:DRAWTO H-46,V-11
410 GOTO 220
420 REM Toggle each cell:
430 FLAG=0:FOR COL=2 TO 10 STEP 2:FOR
ROW=0 TO 8
440 X=COL*4+50:Y=ROW*8+1
450 LOCATE X,Y,Q:IF Q<>2 THEN 510
460 IF FLAG=1 THEN 490
470 GOSUB 1220:FLAG=1
480 ? "KNB: Blocks on vertical lines c
annot":? "be toggled correctly, so are
 erased."
490 COLOR 3:FOR R=Y TO Y+6:PLOT X-3,R:
DRAWTO X+3,R:NEXT R
500 COLOR 1:PLOT X,Y:DRAWTO X,Y+6
510 NEXT ROW:NEXT COL
520 FOR ROW=0 TO 7:FOR COL=0 TO 10 STE
P 2
530 X=COL*4+51:Y=ROW*8+1:LOCATE X,Y,Q
540 Z=2:IF Q=2 THEN Z=3
550 COLOR Z:FOR R=Y TO Y+6
560 PLOT X,R:DRAWTO X+6,R
570 NEXT R:NEXT COL:NEXT ROW
580 IF FLAG=1 THEN GOSUB 1190
590 RETURN
600 REM Fill each cell:
610 FOR ROW=0 TO 64:PLOT 50,ROW:DRAWTO
 98,ROW:NEXT ROW
620 COLOR 1:FOR ROW=0 TO 64 STEP 8:PLO
T 50,ROW:DRAWTO 98,ROW:NEXT ROW
630 FOR COL=50 TO 98 STEP 8:PLOT COL,0
:DRAWTO COL,64:NEXT COL
640 RETURN
650 REM Open printer:
660 TRAP 1150:CLOSE #1:OPEN #1,8,0,"P:
"
670 REM Convert pattern into numbers:
680 OK=0:F=0:FOR COL=1 TO 11
690 T=0:FOR ROW=1 TO 8:LOCATE COL*4+50
,ROW*8-4,Q
700 LOCATE COL*4+50,ROW*8-4,Q:IF Q<>2
THEN 720
710 T=T+2^(8-ROW):F=1
720 NEXT ROW:M(COL)=T:NEXT COL
730 IF F=0 THEN GOSUB 1220:? "KNo char
acter to convert!":GOSUB 1180:RETURN
740 REM Specify character type:
750 POKE 764,255
760 ? "K1=Standard, no descender
ESC=Exit"
770 ? "2=Standard, with descender"
780 ? "3=Proportional, no descender"
790 ? "4=Proportional, with descender"
;CHR$(28);
800 K=PEEK(764):IF K=255 THEN 800
810 POKE 764,255
820 IF K=28 THEN 210
830 IF K<>24 AND K<>26 AND K<>30 AND K
<>31 THEN GOSUB 1220:GOTO 760
840 FLAG=128:IF K=24 OR K=30 THEN FLAG
=0
850 A=0:IF K<>24 AND K<>26 THEN A=11:G
OTO 920
860 TRAP 860:? "KSpecify start,end pos
ition numbers:"
870 ? "Start position (0-6)";:INPUT ST
ART:IF START<0 OR START>6 THEN 860
880 ? "End position (6-11)";:INPUT FIN
:IF FIN<6 OR FIN>11 THEN ? CHR$(28);CH
R$(156);:GOTO 880
890 Q=(START<0)+(START>7)+(FIN<4)+(FIN
>11)+(START+4>FIN)+(FIN-START<5):IF Q=
0 THEN 910
900 GOSUB 1220:? "Illegal - check your
 printer manual.";:GOSUB 1180:GOTO 210
910 A=16*START+FIN
920 M(0)=A+FLAG:OK=1:REM "Attribute" b
yte
930 RETURN
940 REM Specify print mode:
950 TRAP 1150:CLOSE #1:OPEN #1,8,0,"P:
"
960 POKE 764,255
970 ? "K1=Pica     2=Enlarged    3=Cond
ensed"
980 ? "4=Enlarged-condensed     5=Empha
sised"
990 ? "6=Enlarged-emphasised   7=Elite
"
1000 ? "ESC=Return to Edit mode";CHR$(
```

```
28)
1010 K=PEEK(764):IF K=255 THEN 1010
1020 POKE 764,255:IF K=28 THEN RETURN
:REM ESC Key pressed
1030 PMODE=16*(K=31)+48*(K=30)+20*(K=2
6)+52*(K=24)+24*(K=29)+56*(K=27)+17*(K
=51)
1040 IF PMODE=0 THEN GOSUB 1220:GOTO 9
70
1050 ? #1;CHR$(27);"!";CHR$(PMODE);
1060 ? #1;CHR$(27);":";CHR$(0);CHR$(0)
;CHR$(0);:REM copy from ROM to RAM
1070 ? #1;CHR$(27);"&";CHR$(0);"AA";:R
EM Replace character "A" only
1080 FOR T=0 TO 11:? #1;CHR$(M(T));:NE
XT T
1090 ? #1;CHR$(27);"%";CHR$(1);CHR$(0)
1100 ? #1;"A AAA abcAAgjy IIAAMM   ";:
REM Print new character in various com
binations
1110 ? #1;CHR$(27);"!";CHR$(16);
1120 FOR T=0 TO 11:? #1;M(T);"  ";:NEX
T T
1130 ? #1;CHR$(155);:GOTO 950
1140 ? "K";:FOR T=0 TO 11:? M(T);" ";:
NEXT T:? :GOTO 1180
1150 GOSUB 1220
1160 IF PEEK(195)<>138 THEN ? "KERROR
";PEEK(195);" AT LINE ";PEEK(186)+256*
PEEK(186):END
1170 ? "KPrinter is not responding.":G
OSUB 1180:GOTO 210
1180 POKE 764,255
1190 ? :? "Press ESC to continue....";
1200 IF PEEK(764)<>28 THEN 1200
1210 POKE 764,255:RETURN
1220 SOUND 0,50,10,8
1230 FOR W=1 TO 30:NEXT W
1240 SOUND 0,0,0,0
1250 RETURN
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM	LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	CAJ (W)	190	35U (6)	410	Q9A (5)	630	J2P (J)	850	JKG (L)	1070	M92 (X)
2	CAK (3)	200	6A5 (C)	420	D3V (G)	640	RPA (V)	860	MEJ (5)	1080	L3D (G)
3	CAL (V)	210	KG6 (4)	430	NV4 (P)	650	DGX (Q)	870	581 (7)	1090	58G (V)
4	CAM (4)	220	WDM (J)	440	CN7 (P)	660	66Q (K)	880	QD4 (3)	1100	JX7 (U)
10	OLQ (J)	230	TOF (Q)	450	YNM (X)	670	DQX (R)	890	Y7T (X)	1110	NXG (E)
20	VG5 (X)	240	EA8 (M)	460	CGJ (4)	680	Q8C (4)	900	394 (4)	1120	773 (H)
30	K6J (7)	250	77G (Q)	470	6N4 (W)	690	SV1 (M)	910	9QD (G)	1130	KS2 (7)
40	VQU (W)	260	37V (R)	480	JNG (8)	700	MYJ (A)	920	CU3 (Y)	1140	10G (V)
50	SWH (N)	270	KR3 (3)	490	C6R (K)	710	DKT (M)	930	RKE (X)	1150	SQH (N)
60	WV8 (M)	280	KQP (P)	500	VLK (O)	720	11X (E)	940	DD1 (T)	1160	AR6 (G)
70	GGR (9)	290	E2K (T)	510	D8E (Y)	730	9P4 (V)	950	62T (J)	1170	A5T (J)
80	LEW (C)	300	TLP (O)	520	CCJ (J)	740	DCY (P)	960	TDN (X)	1180	QFG (H)
90	LFR (T)	310	U13 (6)	530	CWP (Q)	750	T8L (P)	970	EDL (3)	1190	DXS (J)
100	NS2 (D)	320	AJ3 (6)	540	DD6 (Y)	760	9PH (6)	980	MH3 (W)	1200	T67 (H)
110	FMA (D)	330	N40 (5)	550	JP4 (X)	770	J5V (7)	990	41K (S)	1210	84U (9)
120	PGM (V)	340	KEK (C)	560	JXM (9)	780	4KA (L)	1000	MRY (O)	1220	4JF (H)
130	EDR (Y)	350	W46 (P)	570	4DR (6)	790	15Y (Q)	1010	3EG (K)	1230	DM7 (R)
140	62Y (7)	360	83A (D)	580	S52 (9)	800	W5F (5)	1020	88J (M)	1240	03S (J)
150	2WW (X)	370	F2Y (W)	590	SA9 (1)	810	SRM (8)	1030	3YJ (8)	1250	VVK (M)
160	TF2 (4)	380	WQC (3)	600	CUX (8)	820	46U (2)	1040	HDC (Q)		
170	9PR (C)	390	KQY (F)	610	FAA (N)	830	2A9 (8)	1050	YS6 (N)		
180	JEX (A)	400	RDC (L)	620	7NJ (A)	840	24J (Q)	1060	WP3 (1)		

Software Scene

Hopping mad!

Product: Leapster
Price: £1.99 (tape)
Supplier: Atari World, 15 Fennel Street, Manchester.
Tel: 061-834 4941

THIS is one of the strangest games I have ever played on an Atari. You are a young schoolboy called Henry Leapster bent on getting to school on time.

To do so you must travel across the town, through the missile base – very strange town this is – and the graveyard. When I went to school I only got the bus. I must have been missing out on something when I was a young lad.

On each screen you must collect several items which will allow you to progress to the next one.

On the debit side you have to avoid cars, missiles, troops and a number of unfriendly zombies – and before you ask, they aren't retired teachers.

Most of the objects up for collection are located in very difficult positions so you'll find you have to leap on to other things to reach them – hence the name of the game. Be very careful before you jump as a mistake can result in sudden death.

You control Henry using a joystick plugged into port one. If you want to take a coffee break press the Start function key – pressing it again will restart the game. Select will turn the sound effects on or off and Option will toggle the title music on or off. The graphics are nicely presented and the sound effects well implemented.



Playability caused me some concern though. Although I started off enjoying this very original game I quickly tired of it. This is unfortunately a problem with a lot of budget games today.

If Leapster cost £9.99 I would have to think very carefully about recommending it. As it's priced at £1.99 give it a try.

Neil Fawcett

Sound	6
Graphics	7
Playability	5
Value for money	7
Overall	6

Not so ferocious

Product: Airwolf
Price: £1.99 (tape)
Supplier: Atari World, 15 Fennel Street, Manchester.
Tel: 061-834 4941

IN this game from Encore you take the role of Stringfellow Hawke, a former Vietnam chopper pilot, and the only man in the free world trained to fly the billion dollar helicopter Airwolf, the latest in hi-tech killing machine.

You have been recruited by the Firm to undertake a dangerous rescue mission. Five important US scientists have been taken hostage and are being held in a subterranean base beneath the Arizona desert.

You must guide Airwolf through enemy defences – using its special stealth capabilities – on a series of night-time missions. Only the destruction of the defence control boxes – strategically positioned deep within the enemy installations – will allow you to descend into the heart of the base where the scientists are being held.

It's not an easy task and I found this game rather difficult to master although it has a certain addictiveness.

The graphics disappoint – being rather dull and colourless. I don't think the programmers have ever heard of Display Lists or Vertical Blanks. Versions for other micros are vastly better.

There were also times when I couldn't figure out just why my helicopter exploded. On mission two I flew into a cloud and blew up – have clouds suddenly become man's adversary?

Enemy guns fire bouncing bombs. When they reach the edge of the screen they don't go past, but just bounce down again – yet another miracle of modern technology.

The cassette inlay boasts the game has frantic arcade action built in. I became frantic trying to figure out why all the laws of nature had suddenly changed.

The sound effects are absolutely terrible. A bleep here and a boop there are all you get – not a great deal when you consider that the Atari has four sound channels and not a keyboard speaker like the BBC Micro.



Airwolf is playable providing you ignore the occasional and inexplicable destruction of your helicopter.

Neil Fawcett

Sound	3
Graphics	4
Playability	6
Value for money	6
Overall	5

Heavy metal

Product: Kampfgruppe
Price: £19.99 (disc)
Supplier: SSI/US Gold, Units 2/3 Holford Way, Holford, Birmingham BS 7AX.
Tel: 021-356 3388

THE expanse of land dotted with rubble is quite still, save for a distant clanking which soon becomes a crescendo of straining gears, of giant treads crushing rocks into dirt.

These are the pride of Germany's armoured force – the dreaded Panthers.

This is the way SSI gets you into the mood to play Kampfgruppe, a tactical wargame simulating tank warfare on the Eastern Front. Spanning the years 1941-45, it puts you in command of either a German or Russian battle group.

Available only on disc, you load it by removing all cartridges from old Atari micros, or holding down the Option key and switching on with your game disc in drive one. Once loaded you choose what game you want from the options menu and away you go.

Your commands to your motorised units are sent via a status window at the bottom of the screen.

The action is split into several phases and you will have to read the manual carefully before you can understand their operation fully.

All game play takes place on a full colour map. This is composed of a 60 by 60 grid, of which 20 by 10 squares may be viewed at one time. By pressing keys 1 to 8 you can move your cursor around the map.

When this cursor highlights an armoured unit a description of it will be displayed in the status window.

You have a quick reference chart to identify the terrain and units. I found it useful to place sticky backed plastic around it to stop it getting dog-eared.

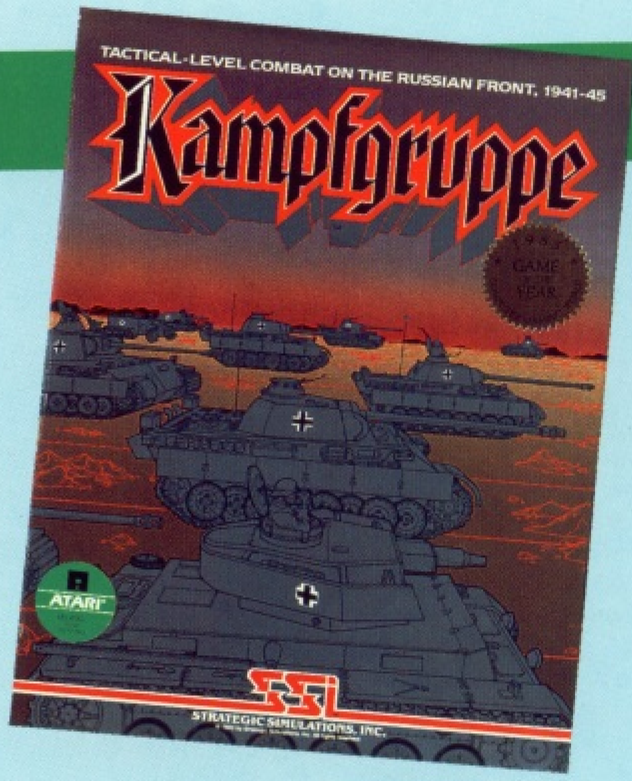
Many historical scenarios are detailed within the booklet supplied, and as with all SSI products, it is very well written.

At the end of it is a short story about Ivan and the Valkyries.

This makes for very interesting reading and adds a feeling of reality to the packaging.

Kampfgruppe is an excellent tactical simulation and will provide many interesting hours of enjoyment as you re-enact momentous battles from WWII.

Dave Manning



Sound	*N/A*
Graphics	*5*
Documentation	*8*
Playability	*7*
Value for money	*6*
Overall	*6*

Great quartet

Product: Four Great Games III
Price: £5.99 disc, £3.99 tape
Supplier: Microvalue/Tynesoft, Unit 3, Addison Industrial Estate, Blaydon, Tyne and Wear NE21 4TE.
Tel: 091-414 4611

FOUR Great Games III is the latest budget package to come from Tynesoft/ Microvalue.

The four games you get are pretty varied and one of them is an old full price best seller. However, I found **Rebound** the best, a game I previewed in the March 1988 issue of *Atari User*.

The title screen uses varying text fonts and colour to good effect and the accompanying music is a superb percussion piece which really gets your foot tapping. As you play, the music can be heard in the background – a feature that I really like.

As to the game itself, imagine that you cut a tennis court, in half along the net, then place one half at the top of the screen and the other at the bottom. You have a bat at each end moving left and right. Add a ball and build the sides of the court up so the ball can rebound off them and there you have it.

There are three levels of play. The first is just right for the novice, but don't try level three unless you have the speed and reactions of Boris Becker.

The object is to score seven points, or goals, accomplished by making your opponent miss the ball so it passes his bat.

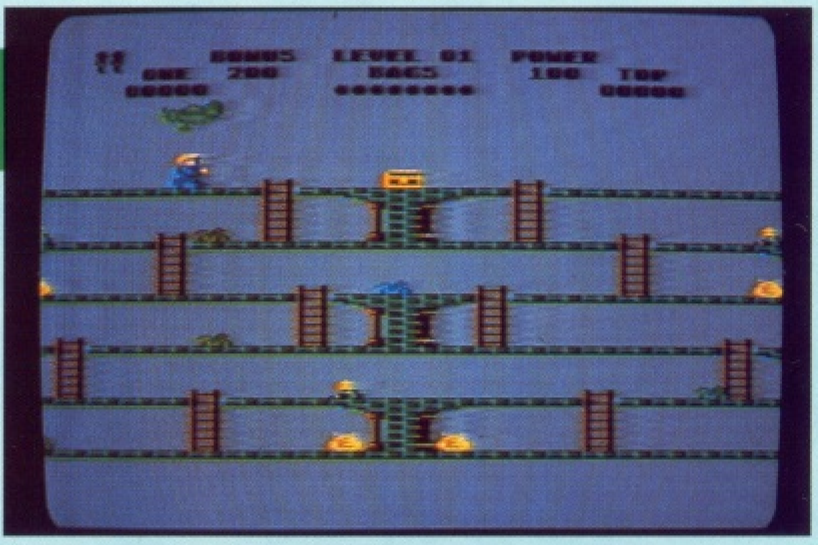
The game has all the features needed to make it a winner were it released as a full price game. As a budget offering it's wonderful value for money.

Next comes **Phantom**. You play the part of a professor of astrophysics interested in psychic phenomena.

You just happen to be in possession of a nuclear accelerator. You arrive at Ye Olde Inn, and are met with a plan view that looks more like a maze. Scurrying around are ghosts who, when they see you, begin to converge. So with reactor in hand you are well prepared for the horrors that face you.

The graphics used throughout are first rate and

Deep in a hole



Product: Desmonds Dungeon
Price: £1.99
Supplier: Atari World, 15 Fennel Street, Manchester.
Tel: 061-834 4941

THE fiendish Alfonso Schwarz has found the ideal place to hide his plundered gold. He's stashing it in an underground dungeon, a labyrinth of connecting passageways.

Then one day our hero Desmond – that's you – out for a walk, stumbles across Alfonso's hiding place. Realising that the vast fortune could be his, he descends into the depths to seek out all the loot.

The gold is scattered around the dungeon in bags which you collect one at a time before returning to the surface with it. As usual there are a multitude of nasties lurking around the corner waiting to do you no end of harm.

Large, furry spiders want to tear your throat out and deadly plungers will stun you if you get stuck underneath one.

Each time Desmond is stunned his strength is reduced. If it reaches zero he will automatically be given another re-charge unit. You start with three and when they have all gone the game is over.

Occasionally Alfonso flies overhead to drop off some more loot. If he sees you he will attempt to dive bomb you and drop a bag of gold on your head. This also will reduce your energy level.

The game is split into two sections – the dungeon and the vault. In the dungeon you must collect bags of gold from the floor. When you reach the vault you have to catch the bags when they are dropped. Then you have to throw them back into a grab which passes overhead.

On later levels some gold is hidden behind locked doors and you have to find the key before you can get to it.

You control Desmond using a joystick plugged into port one. Pressing the Select key will pause the game and you just move the joystick to restart. If you get tired of the music press Return to switch it off.

The sound and graphics are superb. Coupled with the overall addictiveness, this budget game is a definite winner in my book – buy it.

Neil Fawcett

Sound	*9*
Graphics	*8*
Playability	*9*
Value for money	*10*
Overall	*9*

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coupled with the wonderful background music add a splendid feel to the game. Phantom is also well worth buying on its own.

Now on to the two new games on the compilation pack – **Countdown** and **Cannibals**. The former is based on the exploits of Commander Zakarius Fitzwilliam – played by you.

Apparently, an American B52 bomber has lost one of its AZ Stratohawk bombs. It has been located but unfortunately its casing has been damaged and it is leaking radioactive particles.

You have already sent in a TP1 remote droid unit but it has been damaged by the radiation. To add to your troubles, the tools you need to repair the bomb have been lost by the TP1 when it went berserk.

You have to collect the four tools you require – in the correct order – and disarm the bomb before the timer reaches zero.

However the TP1 is still roaming around and if it touches you it'll disarm you – permanantly. And if you make any contact with the radiation particle cloud you'll die.

If you move on to the bomb before you have collected all four tools you will also lose a life.

Countdown isn't a bad game, neither is it anything to write home about. Reasonable sound and graphics make it fair value on a budget compilation.

Now on to the last of the four, **Cannibals**. The plot revolves around the exploits of Arthur who is having a nightmare, pursued by robots, ghosts, aliens and cannibals.

You take Arthur's part as he scrambles around several platforms trying to escape. Armed with a shovel, you must dig a hole in which to trap the monsters and then bash them over the head.

All in all this package is wonderful value for money.

Neil Fawcett

Sound	*7*
Graphics	*7*
Playability	*9*
Value for money	*10*
Overall	*8*

Figures are an average taken for all games





Caverns of Nala

Can you destroy the robot killers? Find out in DEREK THOMPSON's fast-action game of survival

IT is the year 2367 and the world is under the threat of total destruction from a danger created by its inhabitants themselves.

Their mistake was a simple one. All they had wanted was the perfect civilisation, so to make it possible they perfected the positronic brain, the ultimate synthetic personality.

But as with all dreams of perfection something was bound to go wrong – and it did. In 2365 a group of synthetic people – androids – rebelled against their owners and caused a number of deaths as they escaped.

Now, they have returned and plan to destroy mankind so that they can rule the Earth.

The military minds, at a loss as to what to do, called in you, bounty hunter Chuck Masters. You have a reputation as a violent, shoot-first, think-later killer. Just the qualifications for the assignment.

The Earth Intelligence Department has correlated months of reports of sightings and fed them into Zig, your ship's computer. After your briefing you transport on to the mother ship and set course for the Nala caverns where you believe the androids to be hiding out.

Once there you board your own ship and discover that the androids already know of your presence and are waiting for you.

You control your ship with a joystick plugged into port one. Up, down, left and right move you in the desired direction, while the fire button operates the thrusters which accelerate your craft.

Your prime directive is to destroy eight android vessels, two of which are located on each of the four levels. Each level gets consistantly more difficult, with mines, laser barriers, falling bombs and narrow passageways to navigate.

Located around the caves are a number of fuel dumps – marked with an F. By landing on them you can refuel and continue your search.

You ram an android craft to destroy it and once you have blown up all the enemy vessels you must leave the tunnels and dock with the mother ship to complete your mission.

The game can be paused at any time by pressing the Option key. If during the pause you hold down all of the function keys – Start, Option and Select – you can move on to the next level.

VARIABLES

A$	Holds instructions
B$	Holds the rank for your final score
MIS$	Guns on
OFF$	Guns off
SHIPPOS	Moves the mother ship
FUEL	Fuel left
GUNS	Subroutine for guns
MSHIP	Subroutine to move the mother ship

100-120	Set up strings
250-480	Main loop
490-590	Collision detection routine
690-800	Drop bombs routine
810-880	Guns on routine
900-960	Guns off routine
970-1030	Move the mother ship
1040-1080	Plot mines routine
1090-1350	Player missile movement routine
1360-1600	Redefine the character set
1610-1740	Main screen
1750-1870	Docking tune routine
1880-2420	Level complete routine
2430-2490	Title screen and instructions

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How to Join: See Page 14

Wishful thinking



Rouloc reminisces on an old much loved adventure

NOT a lot is happening in the adventure world as I write, so I'll gratefully seize the opportunity to reminisce about one of the older, but much-loved adventures in my collection, Infocom's Wishbringer. With the price of 8 bit Ataris and disc drives being quite low these days, more and more people are playing adventures. It's very likely that many of you have never tried any of the Infocom text adventures, let alone Wishbringer. For those who have, I'm sure you'll enjoy a wallow in nostalgia – and who knows, you may even decide to play them all over again.

Wishbringer is available on disc only and was written by Brian Moriarty, who was later to go on and write the excellent Trinity adventure for the same company.

The game is aimed at the novice adventurer but still offers a great deal of pleasure to even the most seasoned of players. What it may lack in difficulty for the experienced adventurer, Wishbringer more than makes up for in wit, originality and charm.

You begin as an assistant in the local post office of Festeron. Your boss, Mr Crisp, a cantankerous so and so, sends you off to deliver a letter to the old woman who owns Ye Olde Magick Shoppe at the top of the hill at the north end of town. It's well worthwhile spending some time exploring the town, even though your boss does tend to shout at you from afar when he sees you dawdling.

The reason for the reconnoitre is that things will change very suddenly once you've delivered the letter. So it's best to have a good look while you still can. In any case, there are a certain number of items you'll need to find to help your progress later.

The cemetery is always a good place to start, and particularly so in Wishbringer. The graveyard sports such appropriately named places as Spooky Copse, Creepy Corner and Twilight Glen.

You may not find the strange gravedigger or the open grave very welcoming, but persist and you will find something to your advantage.

There's a snappy poodle not far from the post office and you'll need to

HINTS AND TIPS

This month's hints and tips concentrate on Jinxter, the popular Rainbird and Magnetic Scrolls follow-up to The Pawn and Guild of Thieves.

Their latest, Corruption, should be with us any time now and there's also Lancelot, Mandarin Software's newest product from Level 9 to look forward to as well.

Jinxter

● *Bull a problem?*

Try acting like a matador with something red.

● *Batty gardener keeps running off when you approach?*

The squeaky doors alert him. Get the plastic bottle and put the contents in a bigger container then freeze it to get the oil. Put the oil on the runners of the boathouse door.

● *Canoe got a hole in it?*

Wrap your sock round the bung and bung it in.

● *Baking a loaf proving difficult?*

Sieve the flour to get the charm. Shove it in the baking tin with the dough then overbake it in the oven.

● *Mound of dirt in the way?*

A pair of gloves and a can of worms is all you need.

● *Want to see in the dark?*

Stand under the holly bush near the herb garden and listen to the magpie – he'll give you something spectacular!

● *Can't open the mailbox?*

Tricky one, this. You need to warm the plastic key – twice – with the candle before putting the key in the lock.

◀ From Page 17

do something about the ankle-biting mutt if you're not to be forced to take a detour round it. The video game arcade and pleasure wharf are also worth a visit.

When you finally deliver the letter to the old lady, you'll discover what you have actually handed over is a ransom note. "Deliver the Magick Stone to me before the moon sets or you will never see your cat again. Signed, The Evil One".

Well, never one to fail to help a fellow human being in distress, you offer to assist in finding the good woman's cat with the aid of the legendary Wishbringer stone. Once you return down the hill, things have taken a serious turn for the worse. The whole town has altered – and not for the good.

A sort of decaying, evil influence has affected every place, object and human in Festeron. For instance, where once goldfish swam in the pool in the park, there is now a piranha. The poodle has become a hellhound, the post office a tower – no, not the Post Office tower – complete with torture chamber and laboratory, and there is now a Grue's nest under your favourite hillside beauty spot.



Magic features strongly in Wishbringer. "Seven is the number of the wishes bound into the stone: And if ye speak a wish, that wish is spent and lost forever. Also know, that ye must hold the wishing-stone within thy hands to wield its magick". In fact, not all the wishes are usable only once.

A wish will only work if you are also carrying a special object that relates to it. For example, a broomstick must be held when making the wish of flight. The other six wishes are for rain, advice, darkness, foresight, luck and freedom. One of the interesting features of the game is that you can complete it without using all of the wishes – it's up to you how you go about achieving your objectives.

There are many funny moments in Wishbringer, not least when a formerly inanimate mailbox suddenly becomes alive and tries to eat you. I loved the Grue puzzle. Fans of Infocom games will know that Grues are creatures who dwell in the dark and are the scourge of lamp-less adventurers. They appear in many of Infocom's adventures, and in Wishbringer there's even a baby one, the puzzle revolving around a bottle of Grue's milk.

While most of the puzzles are fairly easy to solve, one or two will have even the most skilled of adventurers scratching their heads for a while. The atmosphere and wit are what make this adventure so enjoyable, so if you haven't yet played Wishbringer, I hope I've whetted your appetite enough for you to go and try it.

THE XIO – Extra Input-Output – command is probably the Cinderella of Atari Basic. This extremely versatile tool is actually 20 commands rolled into one, but very few people know how to use it. This letter from Jasper Coombes of Bristol highlights the confusion caused by Atari's failure to provide a comprehensive Basic instruction manual.

SOFTWARE Solutions

This month MICK RANDLE takes over from ANDRÉ WILLEY to provide more help for puzzled programmers

I am writing a program which displays high resolution graphics and I believe Atari Basic has a Fill command. But after wasting hours trying to get it to work I resorted to using Plot and Drawto commands, which take ages to type in.

I mentioned my problem to another customer when I visited a local computer shop and he said something about a complicated Basic command called XIO. I did not really understand what he was trying to tell me but I hope you can shed some light on it.

Your acquaintance at the shop was quite correct in suggesting that you use XIO – and like most commands it isn't particularly complicated once you understand it.

Let's examine each component of the command syntax in turn:

XIO code,#IOCB,expr1,expr2,device

The first item after the XIO is the code number which represents the operation to be performed. Although a variety of options are supported, many are duplicated by standard Basic commands – such as Input – and others which relate to the configuration of the 850 interface's RS232 ports.

If we disregard these we are left with the list shown in Figure I. Disc users will already be familiar with most of the options since they are available from the Dos 2.5 menu, but it is not generally realised that they are also available from Basic. As you can see, code 18 indicates the graphics fill operation.

The next component of the XIO command represents an IOCB channel number. Since the operating system always uses IOCB six for graphics output, we must also use it for the graphics fill operation. Any IOCB from one to seven may be used for the disc options, provided it is not already in use.

The next two components are only important when using the RS232 ports and they should be set to zero for all the options we are discussing. What could be easier?

The final component is the name of the device which is to be the subject of the action. The Atari considers almost everything to be a peripheral device – even the keyboard and monitor screen – and each device is given a name, such as K: for the keyboard and S: for the screen. When using the graphics fill option we must use the screen device name. Disc users must use the full disc filename to enable access to individual files.

Disc users should also be aware of a special feature of XIO. Normally, it is necessary to issue an Open command before a disc file can be accessed. This is not the case with XIO which automatically opens the IOCB, performs its task and then closes the IOCB afterwards. Program I is an example of what can be achieved from Basic. Note the neat little trick which writes DOS.SYS to the disc. Unfortunately, this does not work with the DUP.SYS file.

The graphics fill option is slightly more involved, but all will become clear when you understand why certain actions are necessary. The easiest way to explain this is to describe

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CODE	PURPOSE	EXAMPLE
18	Graphics colour fill	XIO 18,#6,0,0,"S:"
32	Rename disc file	XIO 32,#1,0,0,"D:NAME1,NAME2"
33	Delete disc file	XIO 33,#2,0,0,"D2:FILENAME.EXT"
35	Lock disc file	XIO 35,#4,0,0,"D:ATARI.USR"
36	Unlock disc file	XIO 36,#2,0,0,"D4:MYFILE.OBJ"
253	Single density format	XIO 253,#1,0,0,"D:" (XL/XE only)
254	Disc format	XIO 254,#2,0,0,"D2:"

Figure I: Table of XIO commands and their function in Atari Basic

```
10 REM PROGRAM I
20 REM SOFTWARE SOLUTIONS
30 REM DOS 2.5-XIO DEMO
40 REM
50 REM
60 REM This program formats a disc
70 REM so ensure that you use one
80 REM containing no useful data
90 REM
100 GRAPHICS 0
110 ? "PRESS RETURN FOR DISC FORMAT"
120 POKE 764,255
130 IF PEEK(764)=255 THEN 130
140 ? :? "PLEASE WAIT"
150 REM
160 REM Format disc in drive 1
170 XIO 254,#7,0,0,"D1:"
180 REM
190 REM Write DOS.SYS to disc
200 OPEN #1,8,0,"D1:DOS.SYS":CLOSE #1
210 REM
220 REM Lock the DOS.SYS file
230 XIO 35,#7,0,0,"D1:DOS.SYS"
240 END
```

Program I: Format a disc using the X10 command

```
10 REM PROGRAM II
20 REM SOFTWARE SOLUTIONS
30 REM XIO COLOUR FILL DEMO
40 REM
50 REM
60 GRAPHICS 7
70 DELAY=1000:GOSUB DELAY
80 REM
90 REM Draw a triangle
100 COLOR 1:PLOT 50,20:DRAWTO 100,70
110 DRAWTO 0,70:DRAWTO 50,20
120 GOSUB DELAY
130 REM
140 REM Colour the triangle
150 PLOT 50,20:POSITION 0,70
160 POKE 765,1
170 XIO 18,#6,0,0,"S:"
180 GOSUB DELAY
190 REM
200 REM Draw a square
210 COLOR 2:PLOT 95,0
220 DRAWTO 159,0:DRAWTO 159,60
230 DRAWTO 95,60:DRAWTO 95,0
240 GOSUB DELAY
250 REM
260 REM Colour the square
270 PLOT 95,0:POSITION 95,60
280 POKE 765,2
290 XIO 18,#6,0,0,"S:"
300 GOSUB DELAY:RUN
310 REM Slow down the action
1000 FOR Q=1 TO 400:NEXT Q:RETURN
```

Program II: X10 fill demo

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what happens when the Atari is told to fill a pre-drawn shape with colour.

Colouring begins at the top left corner of a shape and continues horizontally until it hits the right hand boundary of the shape. It then drops down a line and, beginning at the left edge, repeats the process until it has finished colouring the last line.

Before we can begin colouring we must tell the computer where on the screen to start and where to stop, and which colour we want it to use. These three instructions should be executed in the correct order to avoid unpredictable results:

- Define the top left point by using the Plot command.
- Define the bottom left point by using the Position command.
- Define the fill colour by poking the colour register number into address 765 – in the form Poke 765,2.

Program II draws and fills two shapes, so you should have no difficulty in following the process.

Now that we know how to fill existing shapes with colour we can proceed to the next stage – which provides us with a short cut. Since we use Plot and Position to indicate the top left and bottom left points of the shape, it does not matter if the left edge is not pre-drawn on the screen. Similarly, since the colour fills from left to right, any existing bottom edge will be overwritten by the XIO process.

Program III is the short cut version of Program II. Notice we don't use the Position command to define the top left corner this time – Drawto performs the same function.

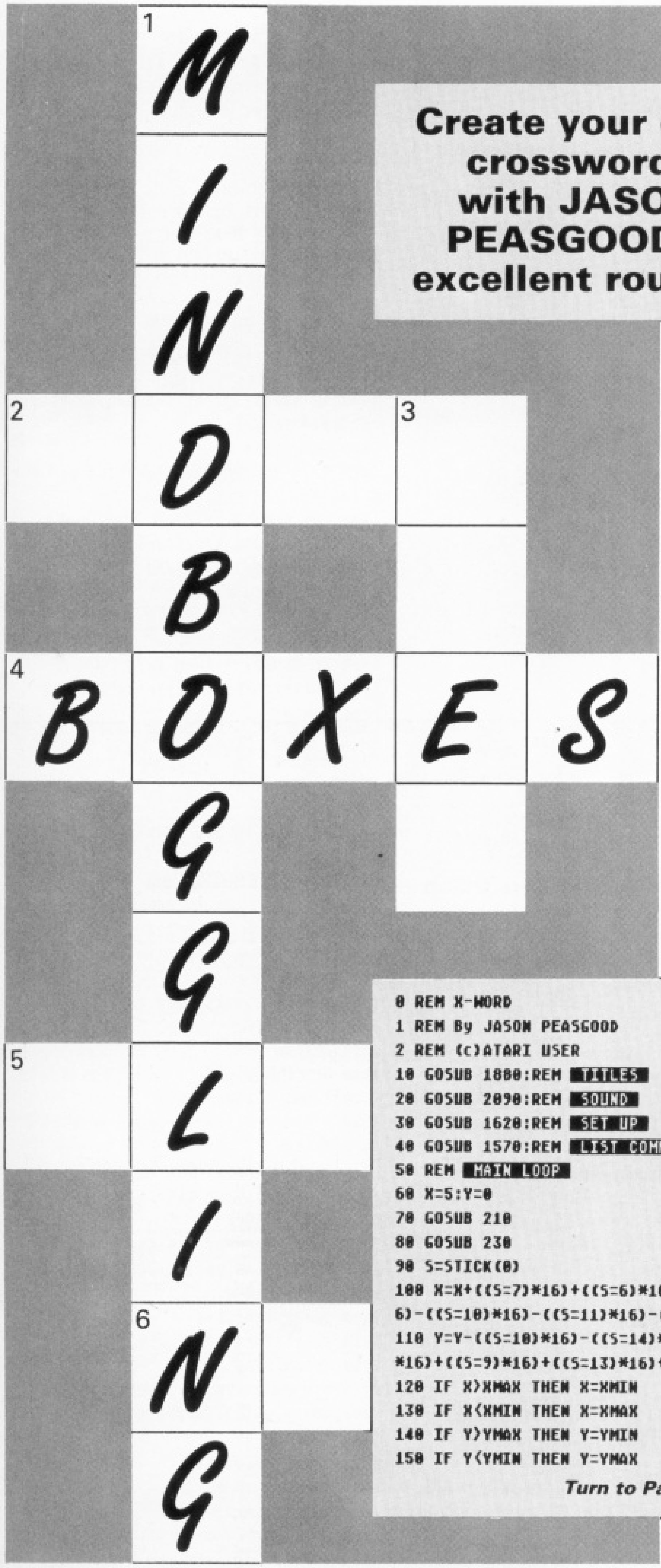
As usual there are a couple of things to bear in mind when using XIO graphics fill. The left edge of a shape must be a straight line. If you have an irregularly shaped polygon, you must divide it into smaller sections, each having a straight left edge, and perform several XIO commands to fill the entire shape.

Finally, since the colouring stops when it hits the right hand edge, you can only colour an area which contains the background colour – Color 4. Any other colour in the shape will be assumed to be the edge and the colouring will stop at that point.

```
10 REM PROGRAM III
20 REM SOFTWARE SOLUTIONS
30 REM XIO COLOUR FILL DEMO
40 REM SHORTER VERSION OF PROGRAM 2
50 REM
60 GRAPHICS 7
70 DELAY=1000:GOSUB DELAY
80 REM
90 REM Draw right edge of a triangle
100 COLOR 1:PLOT 100,70:DRAWTO 50,20
120 GOSUB DELAY
130 REM
140 REM Colour the triangle
150 POSITION 0,70
160 POKE 765,1
170 XIO 18,#6,0,0,"S:"
180 GOSUB DELAY
190 REM
200 REM Draw top and right edge
210 REM of a square
220 COLOR 2:PLOT 159,60
230 DRAWTO 159,0:DRAWTO 95,0
240 GOSUB DELAY
250 REM
260 REM Colour the square
270 POSITION 95,60
280 POKE 765,2
290 XIO 18,#6,0,0,"S:"
300 GOSUB DELAY:RUN
310 REM Slow down the action
1000 FOR Q=1 TO 400:NEXT Q:RETURN
```

Program III: Shorter version of Program II

Create your own crosswords with JASON PEASGOOD's excellent routine



X-WORD is a program which allows you to make a crossword up to a maximum grid size of 19 by 10 squares. Once completed it can then be printed out to an Atari 1029 dot matrix printer.

Type in the listing, check it with Get it Right! and save a copy before running it. Plug a joystick into port one then run it. The title screen will now start to draw – if you don't want to look at it press the fire button to bypass it.

Next you are prompted to enter the size of the crossword you want to design. Your X coordinate must range from 3 to 19 with your Y entry between 3 and 10. Your crossword grid will then be drawn on-screen. A menu of commands appears below and a flashing cursor will be drawn in the bottom left hand corner of the grid.

Move it to the square you want to position a word and press W for write word. When you have input a word press Return and it will be drawn horizontally on the grid.

If you want to place a word vertically press D and you will be prompted for your input. The program automatically checks to see if a word will fit, so you can't really go wrong... famous last words!

To place a black square on your crossword just move your cursor to the desired square and press F. To cancel it press F again. If the computer encounters a black square while plotting a word it will place as much of it as it can on the grid and then tell you there is a block in the way.

You can quit at any time by pressing Q to start all over again. If you forget the correct key presses, the Help key will reveal the command menu.

Once you have completed your crossword you can initialise the printing routine by pressing Start. Press any key when the prompt appears to print out the solution. After printing is completed you will be asked if you want to print out the final crossword which will appear as the grid and numbers with no words.

Finally you will be prompted to enter the clues for each word – across first followed by clues for words down. You are reminded what each word is and are allowed up to 50 characters in which to describe it.

If you don't have an Atari 1029 printer you can replace the screen dump routine in the program – lines 2980 to 3140 – with a suitable Graphics 8 dump routine for your own printer. The clues are all printed using the standard LPRINT command.

```
0 REM X-WORD
1 REM By JASON PEASGOOD
2 REM (c)ATARI USER
10 GOSUB 1880:REM TITLES
20 GOSUB 2090:REM SOUND
30 GOSUB 1620:REM SET UP
40 GOSUB 1570:REM LIST COMMANDS
50 REM MAIN LOOP
60 X=5:Y=0
70 GOSUB 210
80 GOSUB 230
90 S=STICK(0)
100 X=X+((S=7)*16)+((S=6)*16)+((S=5)*1
6)-((S=10)*16)-((S=11)*16)-((S=9)*16)
110 Y=Y-((S=10)*16)-((S=14)*16)-((S=6)
*16)+((S=9)*16)+((S=13)*16)+((S=5)*16)
120 IF X>XMAX THEN X=XMIN
130 IF X<XMIN THEN X=XMAX
140 IF Y>YMAX THEN Y=YMIN
150 IF Y<YMIN THEN Y=YMAX
```

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```
160 IF PEEK(764)<>255 THEN 320
170 IF PEEK(53279)=6 THEN 2400
180 IF PEEK(732)=17 THEN GOSUB 1570:POKE 732,0
190 GOTO 70
200 REM  CURSOR 
210 LOCATE X,Y,Z:COLOR Z+1:PLOT X,Y:DRAWTO X,Y+14:DRAWTO X+14,Y+14:DRAWTO X+14,Y:DRAWTO X,Y
220 RETURN
230 COLOR Z:PLOT X,Y:DRAWTO X,Y+14:DRAWTO X+14,Y+14:DRAWTO X+14,Y:DRAWTO X,Y
240 RETURN
250 REM  CALCULATE PLACE 
260 X2=((X-5)/16)+1:Y2=(Y/16)+1
270 RETURN
280 REM  CALCULATE PLACE 
290 X=((X2-1)*16)+5:Y=(Y2-1)*16
300 RETURN
310 REM  COMMAND 
320 KEY=PEEK(764):POKE 764,255
330 IF KEY=47 THEN 400
340 IF KEY=46 OR KEY=12 THEN 440
350 IF KEY=63 THEN 690
360 IF KEY=58 THEN 730
370 IF KEY=56 THEN GOSUB 770
380 GOTO 190
390 REM  QUIT 
400 ? "Are you sure (Y/N) ??";:INPUT A$
410 IF A$<>"Y" THEN GOTO 190
420 ? "Okay.":RUN
430 REM  WORD 
440 LOCATE X,Y,Z
450 IF Z=1 THEN GOSUB 2140:GOTO 670
460 GOSUB 2090:GOSUB 210
470 ? "Input word -->";:INPUT #16;TEXT$:IF TEXT$="" THEN GOSUB 2140:GOTO 670
480 IF DI=ACROSS AND LEN(TEXT$)>XSIZ-((X-5)/16) THEN ? "Too Long.":GOTO 670
490 IF DI=DWN AND LEN(TEXT$)>YSIZ-(Y/16) THEN ? "Too Long.":GOTO 670
500 FOR I=1 TO LEN(TEXT$)
510 CH=ASC(TEXT$(I,I))
520 IF CH<65 OR CH>90 THEN ? "Use alpahbetic upper-case letters only.":POP :GOTO 670
530 NEXT I
540 X3=X:Y3=Y
550 X1=X+4:Y1=Y+8
560 FOR I=1 TO LEN(TEXT$)
570 B$=TEXT$(I,I)
580 CH=ASC(B$):GOSUB 260
590 IF XWORD(X2,Y2)=160 THEN POP :GOSUB 2140:? "Won't fit.":GOTO 660
600 IF XWORD(X2,Y2)=0 THEN POP :GOSUB 2140:? "Won't fit.":GOTO 660
610 XWORD(X2,Y2)=CH
620 GOSUB 2250
630 IF DI=ACROSS THEN X1=X1+16:X=X+16
640 IF DI=DWN THEN Y1=Y1+16:Y=Y+16
650 NEXT I
660 X=X3:Y=Y3
670 GOSUB 230:GOTO 190
680 REM  ACROSS 
690 ? "Direction = Across."
700 DI=ACROSS
710 GOSUB 2090:GOTO 190
720 REM  DOWN 
730 ? "Direction = Down."
740 DI=DWN
750 GOSUB 2090:GOTO 190
760 REM  FILL 
770 LOCATE X,Y,Z
780 COLOR Z+1
790 FOR I=Y TO Y+14
800 PLOT X,I:DRAWTO X+14,I
810 NEXT I
820 CH=((ABS(Z-1))*128)+32
830 GOSUB 260:XWORD(X2,Y2)=CH
840 RETURN
850 REM  NUMBER 
860 CN=1
870 FOR J=1 TO YSIZ
880 FOR I=1 TO XSIZ
890 IF XWORD(I,J)=160 THEN 920
900 IF XWORD(I,J+1)<>160 AND XWORD(I,J-1)=160 THEN NO(I,J)=CN:CN=CN+1:GOTO 920
910 IF XWORD(I+1,J)<>160 AND XWORD(I-1,J)=160 THEN NO(I,J)=CN:CN=CN+1:GOTO 920
920 NEXT I
930 NEXT J
940 CN=1
950 FOR J=1 TO YSIZ
960 FOR I=1 TO XSIZ
970 IF NO(I,J)<>CN THEN 1060
980 X2=I:Y2=J:GOSUB 290
990 X=X+1:Y=Y+1
1000 NUM=CN
1010 IF NUM<10 THEN GOSUB 2790:GOTO 1050
1020 A$=STR$(NUM):NUM=VAL(A$(1,1)):GOSUB 2790:X=X+2
1030 IF A$(1,1)>"1" THEN X=X+2
1040 NUM=VAL(A$(2,2)):GOSUB 2790
1050 CN=CN+1
1060 NEXT I
1070 NEXT J
1080 RETURN
1090 REM  CLUES 
1100 GRAPHICS 0:SETCOLOR 2,0,15:SETCOLOR 1,0,0:POKE 82,2:POKE 752,0:POKE 16,64:POKE 53774,64
1110 ? :? "Please enter clues for X-Word :"
1120 LPRINT "             ACROSS :"
1130 ? :? "ACROSS :"
1140 P$(1)=" ":P$(80)=" ":P$(2)=P$:CN=1
1150 FOR I=1 TO YSIZ
1160 FOR J=1 TO XSIZ
1170 IF NO(J,I)<>CN THEN 1300
1180 CN=CN+1
1190 IF XWORD(J-1,I)=160 AND XWORD(J+1,I)<>160 THEN 1210
1200 GOTO 1300
1210 ? :? "Enter Clue for ";CN-1;" across (";
1220 FOR K=0 TO XSIZ
1230 IF XWORD(J+K,I)<>160 THEN ? CHR$(XWORD(J+K,I));:GOTO 1250
1240 POP :GOTO 1260
1250 NEXT K
1260 ? ")":INPUT CLUE$
1270 IF CLUE$="" THEN 1260
1280 P$(12)=STR$(CN-1):P$(15)=CLUE$
1290 LPRINT P$
1300 NEXT J
1310 NEXT I
1320 LPRINT
1330 LPRINT "             DOWN :"
1340 ? :? "DOWN :"
1350 P$(1)=" ":P$(80)=" ":P$(2)=P$:CN=1
1360 FOR I=1 TO YSIZ
1370 FOR J=1 TO XSIZ
1380 IF NO(J,I)<>CN THEN 1510
1390 CN=CN+1
1400 IF XWORD(J,I-1)=160 AND XWORD(J,I+1)<>160 THEN 1420
1410 GOTO 1510
1420 ? :? "Enter Clue for ";CN-1;" down (";
1430 FOR K=0 TO YSIZ
1440 IF XWORD(J,I+K)<>160 THEN ? CHR$(XWORD(J,I+K));:GOTO 1460
1450 POP :GOTO 1470
1460 NEXT K
1470 ? ")":INPUT CLUE$
1480 IF CLUE$="" THEN 1470
1490 P$(12)=STR$(CN-1):P$(15)=CLUE$
1500 LPRINT P$
1510 NEXT J
1520 NEXT I
1530 ? :? "Okay. X-word Completed.":GOSUB 2090
1540 FOR I=1 TO 500:NEXT I
1550 RUN
1560 REM  LIST COMMANDS 
1570 ? "        Quit Word Across Down Fill "
1580 ? "        [HELP] to show commands."
1590 ? "        [START] to Print X-Word."
1600 RETURN
1610 REM  SET UP 
1620 ? #6;"K":TRAP 1620
1630 ? "What sizes for your crossword (X x Y) ?"
1640 ? "X-";:INPUT #16,XSIZ
1650 IF XSIZ>19 OR XSIZ<3 OR XSIZ<>INT(XSIZ) THEN 1640
1660 ? "Y-";:INPUT #16,YSIZ
1670 IF YSIZ>10 OR YSIZ<3 OR YSIZ<>INT(YSIZ) THEN 1660
1680 XD=(XSIZ*16)+4
1690 YD=YSIZ*16
1700 GOSUB 2700
1710 DIM XWORD(20,11),CLUE$(100),TEXT$(30),A$(2),B$(19),NO(20,11),P$(80)
1720 TRAP 40000
1730 FOR I=1 TO YSIZ
1740 FOR J=1 TO XSIZ
1750 XWORD(J,I)=32
1760 NEXT J
1770 NEXT I
```

```
1780 FOR I=0 TO YSIZ
1790 XWORD(0,I)=160:XWORD(XSIZ+1,I)=160
1800 NEXT I
1810 FOR I=0 TO XSIZ
1820 XWORD(I,0)=160:XWORD(I,YSIZ+1)=160
1830 NEXT I
1840 ACROSS=0:DWN=1:DI=ACROSS
1850 XMAX=XD-15:YMAX=YD-16:XMIN=5:YMIN=0
1860 RETURN
1870 REM TITLES
1880 GRAPHICS 8:SETCOLOR 2,0,15:SETCOLOR 1,1,1
1890 POKE 752,1:POKE 82,0:POKE 16,64:POKE 53774,64
1900 ? :? "                    X-Word"
1910 ? "            By Jason Peasgood."
1920 COLOR 0
1930 ADX=3:ADY=3
1940 X=5:Y=5:C=0
1950 PLOT X+ADX,Y+ADY
1960 FOR J=1 TO 0 STEP -1:COLOR J
1970 RESTORE 2060
1980 FOR I=1 TO 16
1990 READ X,Y:X=X+5:Y=Y+5
2000 IF  NOT STRIG(0) THEN RETURN
2010 DRAWTO X+ADX,Y+ADY:DRAWTO 160,80:DRAWTO X+ADX,Y+ADY
2020 NEXT I
2030 NEXT J
2040 ADX=RND(0)*214:ADY=RND(0)*54
2050 GOTO 1940
2060 DATA 0,20,30,50,0,80,0,100,20,100,50,70,80,100,100,100,100,80,70,50,100,20,100,0,80,0
2070 DATA 50,30,20,0,0,0
2080 REM SOUND
2090 FOR I=14 TO 0 STEP -2
2100 SOUND 0,50,10,I
2110 SOUND 1,49,12,I
2120 NEXT I
2130 RETURN
2140 SOUND 0,55,12,15
2150 GOSUB 2220
2160 SOUND 0,0,0,0
2170 GOSUB 2220
2180 SOUND 0,55,12,15
2190 GOSUB 2220
2200 SOUND 0,0,0,0
2210 RETURN
2220 FOR I=0 TO 5:NEXT I
2230 RETURN
2240 REM TEXT
2250 SCRN=PEEK(88)+256*PEEK(89):DIS=(X1/8)+(Y1-4)*40
2260 LCN=SCRN+DIS
2270 FOR CHAR=1 TO LEN(B$)
2280 A$=B$(CHAR,CHAR):V=ASC(A$)
2290 IF V>127 THEN V=V-128
2300 IF V>31 AND V<96 THEN V=V-32:GOTO 2320
2310 IF V<32 THEN V=V+64
2320 CL=57344+V*8
2330 FOR BYTE=0 TO 7
2340 POKE LCN+BYTE*40,PEEK(CL+BYTE)
2350 NEXT BYTE
2360 LCN=LCN+1
2370 NEXT CHAR
2380 RETURN
2390 REM PRINT XWORD
2400 FOR I=1 TO YSIZ
2410 FOR J=1 TO XSIZ
2420 IF XWORD(J,I)=32 THEN ? "Please fill all spaces first.":GOSUB 2140:GOTO 190
2430 NO(J,I)=0:NEXT J
2440 NEXT I
2450 ? "Okay. Press any key to print soloution."
2460 ? "Press ESC to abort or Q to print X-Word.";
2470 CLOSE #1:OPEN #1,4,0,"K:"
2480 GET #1,KEY
```

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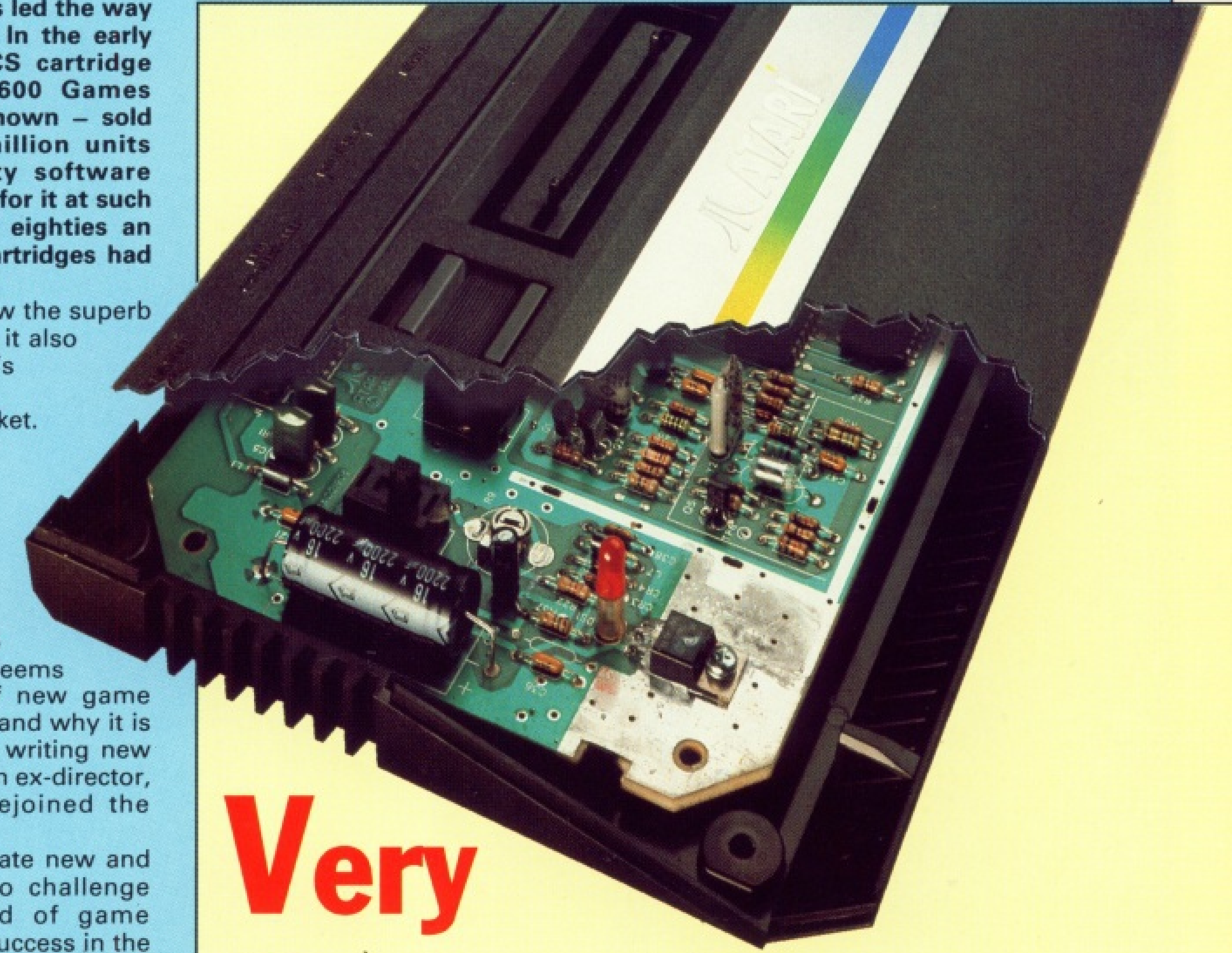
```
2490 IF KEY=27 THEN ? "Aborted.":GOTO 190
2500 IF KEY=81 THEN GRAPHICS 8:SETCOLOR 2,0,15:SETCOLOR 1,0,0:POKE 752,1:POKE 16,64:POKE 53774,64:GOTO 2540
2510 COLOR 1:PLOT 4,0:DRAWTO XD,0
2520 ? "Printing soloution..."
2530 GOSUB 2990
2540 GOSUB 2700
2550 FOR K=1 TO YSIZ
2560 FOR L=1 TO XSIZ
2570 IF XWORD(L,K)=160 THEN X2=L:Y2=K:GOSUB 290:GOSUB 770
2580 NEXT L
2590 NEXT K
2600 GOSUB 860
2610 ? "Okay. Press any key to print X-Word."
2620 COLOR 1:PLOT 4,0:DRAWTO XD,0
2630 CLOSE #1:OPEN #1,4,0,"K:"
2640 GET #1,KEY
2650 ? "Printing X-Word..."
2660 GOSUB 2990
2670 ? "Okay. Completed."
2680 GOTO 1100
2690 REM DRAW GRID
2700 COLOR 1
2710 FOR I=15 TO YD STEP 16
2720 PLOT 4,I:DRAWTO XD,I
2730 NEXT I
2740 FOR I=4 TO XD STEP 16
2750 PLOT I,0:DRAWTO I,YD-1
2760 NEXT I
2770 RETURN
2780 REM PLOT NUMBERS
2790 IF NUM<0 OR NUM>20 OR NUM<>INT(NUM) THEN RETURN
2800 RESTORE 2880+(NUM*10)
2810 READ N,X1,Y1:COLOR 1
2820 PLOT X+X1,Y+Y1
2830 FOR L=1 TO N
2840 READ X1,Y1
2850 DRAWTO X+X1,Y+Y1
2860 NEXT L
2870 RETURN
2880 DATA 4,1,1,1,5,3,5,3,1,1,1
2890 DATA 1,1,1,1,5
2900 DATA 5,1,1,3,1,3,3,1,3,1,5,3,5
2910 DATA 6,1,1,3,1,3,3,1,3,3,3,3,5,1,5
2920 DATA 4,1,1,1,3,3,3,3,1,3,5
2930 DATA 5,3,1,1,1,1,3,3,3,3,5,1,5
2940 DATA 5,3,1,1,1,1,5,3,5,3,3,1,3
2950 DATA 2,1,1,3,1,3,5
2960 DATA 7,1,3,1,1,3,1,3,3,1,3,1,5,3,5,3,3
2970 DATA 5,1,5,3,5,3,1,1,1,1,3,3,3
2980 REM SCREEN DUMP 1029
2990 TRAP 2990
3000 SCREEN=PEEK(88)+256*PEEK(89):IOCB=1:LP=YSIZ*2.4
3010 OFFSET=60
3020 ON PEEK(1570)=6 GOTO 3030:RESTORE 3060:FOR I=0 TO 171:READ A:POKE 1536+I,A:NEXT I
3030 FOR PR=0 TO LP:CLOSE #IOCB:OPEN #IOCB,8,0,"P:":? #IOCB;CHR$(27);"9";CHR$(27);"A";CHR$(1);CHR$(64+OFFSET);
3040 ON OFFSET=0 GOTO 3050:FOR I=1 TO OFFSET:? #IOCB;CHR$(0);:NEXT I
3050 DUMMY=USR(1536,IOCB,SCREEN):SCREEN=SCREEN+280:NEXT PR:CLOSE #IOCB:TRAP 40000:RETURN
3060 DATA 104,104,104,10,10,10,10,141,182,6,104,141,173,6,104
3070 DATA 141,172,6,169,0,141,183,6,32,54,6,24,173,94,6,105,1,141,172,6,173
3080 DATA 95,6,105,0,141,173,6,238,183,6,173,183,6,201,40,208,226,96,162,0,24
3090 DATA 173,173,6,157,95,6,173,172,6,157,94,6,105,40,141,172,6,173,173,6,105
3100 DATA 0,141,173,6,24,138,105,6,170,224,37,144,221,162,0,14,255,255,62,174,6
3110 DATA 14,255,255,62,174,6,14,255,255,62,174,6,14,255,255,62,174,6,14,255,255
3120 DATA 62,174,6,14,255,255,62,174.6,14,255,255,62,174,6,232,224,8,208,209,174
3130 DATA 182,6,169,11,157,66,3,169,174,157,68,3,169,6,157,69,3,169,0,157,73
3140 DATA 3,169,8,157,72,3,32,86,228,96
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
0	CAH (V)	510	C1P (H)	1040	UTG (E)
1	CAJ (1)	520	CVR (S)	1050	TAX (V)
2	CAK (Y)	530	NU5 (X)	1060	N3S (W)
10	SNL (9)	540	XDU (9)	1070	N7S (V)
20	SAM (Y)	550	UHP (3)	1080	VTK (U)
30	SCN (9)	560	DO4 (F)	1090	DHN (Y)
40	SFP (R)	570	YM9 (A)	1100	JK5 (J)
50	CP5 (3)	580	FA3 (6)	1110	TPP (4)
60	KM5 (C)	590	AYX (M)	1120	QLW (5)
70	QFQ (8)	600	2FD (F)	1130	Y7J (K)
80	QKR (4)	610	7EJ (K)	1140	WPA (1)
90	TSP (N)	620	PG6 (P)	1150	FCP (L)
100	PE1 (M)	630	HV5 (F)	1160	FJN (1)
110	S70 (V)	640	1TR (D)	1170	SOJ (U)
120	J08 (Y)	650	P36 (C)	1180	TMX (9)
130	J70 (R)	660	YNF (4)	1190	CXG (A)
140	JEK (K)	670	6A4 (F)	1200	P5V (K)
150	JMA (V)	680	DUX (3)	1210	CY2 (L)
160	SN9 (V)	690	XGM (Q)	1220	FHN (1)
170	L85 (W)	700	Y68 (F)	1230	L6W (2)
180	QCA (D)	710	8M4 (4)	1240	6RS (1)
190	Q97 (Y)	720	D3Y (E)	1250	NES (1)
200	CUT (K)	730	NXX (5)	1260	A22 (M)
210	MSW (R)	740	PDK (2)	1270	QW6 (2)
220	RF6 (K)	750	944 (A)	1280	O4Y (P)
230	RT7 (M)	760	DLY (1)	1290	XHX (8)
240	RP6 (W)	770	V9W (E)	1300	N5S (9)
250	DGT (K)	780	RYG (E)	1310	N5S (8)
260	NXR (N)	790	75N (G)	1320	VNX (H)
270	S26 (W)	800	TOE (3)	1330	RKT (H)
280	DUT (M)	810	NL8 (8)	1340	U9P (G)
290	J6Q (G)	820	ESH (D)	1350	XOA (W)
300	R67 (5)	830	ND9 (8)	1360	FNP (F)
310	CYU (9)	840	RPD (C)	1370	FUN (W)
320	TOF (9)	850	DHO (F)	1380	SGJ (4)
330	E53 (6)	860	DSF (N)	1390	TXX (Q)
340	1TK (T)	870	9TY (S)	1400	AKN (L)
350	ELL (6)	880	9XV (L)	1410	PKD (R)
360	EQ3 (C)	890	VHS (R)	1420	CT5 (S)
370	UAL (N)	900	N6H (U)	1430	FTP (9)
380	RG9 (3)	910	R8J (J)	1440	LLE (C)
390	DYU (C)	920	NQ9 (T)	1450	76U (E)
400	PUM (3)	930	NY9 (H)	1460	NQS (F)
410	PJO (K)	940	DJG (C)	1470	AD2 (R)
420	6L5 (W)	950	9LO (7)	1480	R7C (3)
430	D7V (Q)	960	9PW (C)	1490	OFY (M)
440	UWT (S)	970	N4D (5)	1500	XAX (C)
450	4XD (D)	980	HPF (P)	1510	NGS (9)
460	AAW (2)	990	X4M (N)	1520	NGS (C)
470	TYK (P)	1000	SFD (6)	1530	X6W (T)
480	OL2 (H)	1010	D3R (K)	1540	L82 (6)
490	8MH (L)	1020	X30 (4)	1550	E4J (Y)
500	C84 (W)	1030	MAD (9)	1560	DXN (T)

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1570	PCD (F)	2100	4TG (T)	2630	LX4 (8)
1580	L3F (H)	2110	56C (2)	2640	QX2 (D)
1590	KF6 (N)	2120	MYT (1)	2650	3Y6 (O)
1600	W2K (L)	2130	VML (7)	2660	TLS (1)
1610	DRN (P)	2140	5EL (T)	2670	OSA (O)
1620	AJT (M)	2150	SRJ (H)	2680	Q3W (U)
1630	6QG (M)	2160	O3T (U)	2690	E8P (Y)
1640	PDE (C)	2170	SVJ (J)	2700	TRE (9)
1650	AR2 (X)	2180	5NL (G)	2710	SD4 (W)
1660	PHH (2)	2190	TOJ (6)	2720	D3T (U)
1670	AW9 (R)	2200	YUT (E)	2730	NST (U)
1680	AKD (5)	2210	VML (A)	2740	LHG (V)
1690	OHV (X)	2220	E25 (M)	2750	NS7 (7)
1700	T8H (N)	2230	VRL (L)	2760	NYT (6)
1710	39S (H)	2240	DFP (P)	2770	WML (2)
1720	Q9C (K)	2250	YSO (8)	2780	EAP (6)
1730	FYP (2)	2260	YW4 (T)	2790	VVO (O)
1740	G5N (L)	2270	L5A (O)	2800	J9K (V)
1750	2MP (X)	2280	TAR (W)	2810	9R8 (O)
1760	P1S (V)	2290	K85 (6)	2820	8H9 (S)
1770	P1S (X)	2300	P8H (N)	2830	WQD (8)
1780	G8P (D)	2310	7MR (D)	2840	TO8 (2)
1790	86A (3)	2320	SU5 (N)	2850	JE9 (C)
1800	NQS (7)	2330	DKF (O)	2860	P9T (D)
1810	FXN (J)	2340	3E4 (8)	2870	WRL (G)
1820	3PL (S)	2350	SM2 (E)	2880	FHY (R)
1830	NWS (W)	2360	X1G (5)	2890	O9V (G)
1840	245 (7)	2370	S2T (C)	2900	Q1K (3)
1850	JFX (M)	2380	W6L (F)	2910	SVF (M)
1860	WPK (M)	2390	DVP (8)	2920	F67 (8)
1870	EDN (Q)	2400	FEQ (T)	2930	Q8H (6)
1880	U95 (F)	2410	FLP (8)	2940	QAH (9)
1890	RME (G)	2420	JLU (3)	2950	2Q2 (W)
1900	N1H (3)	2430	DAJ (E)	2960	32Q (R)
1910	J43 (C)	2440	NGT (E)	2970	QGK (N)
1920	U3D (S)	2450	E3P (K)	2980	EKP (P)
1930	UGR (9)	2460	O8S (4)	2990	R2V (2)
1940	YUN (3)	2470	LX4 (L)	3000	C99 (5)
1950	7H4 (L)	2480	QX2 (N)	3010	W72 (8)
1960	UPK (Q)	2490	VDW (P)	3020	107 (N)
1970	O4U (K)	2500	M8K (H)	3030	ACE (X)
1980	4HF (4)	2510	U4D (E)	3040	A65 (V)
1990	7XM (3)	2520	Q85 (1)	3050	MC6 (F)
2000	1WK (D)	2530	T9S (O)	3060	VPU (4)
2010	KYV (2)	2540	T8J (8)	3070	LXW (C)
2020	MUT (1)	2550	G3Q (T)	3080	S1C (2)
2030	MYT (2)	2560	G9P (A)	3090	SKM (E)
2040	VRG (2)	2570	N2E (P)	3100	QM6 (6)
2050	PGW (R)	2580	P1T (M)	3110	UDM (7)
2060	6DO (2)	2590	P1T (Q)	3120	RPT (8)
2070	29J (3)	2600	T41 (F)	3130	V4S (9)
2080	DFP (4)	2610	72H (3)	3140	UO8 (Q)
2090	GT5 (G)	2620	UAD (Y)		


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Very Clever System

In Part 1 of his new series NEIL FAWCETT reveals the facts about the 2600 Games System

OVER the years Atari has led the way in home entertainment. In the early seventies the Atari VCS cartridge game system – or 2600 Games System as it is now known – sold between 35 and 40 million units worldwide. Third party software houses produced games for it at such a rate that by the late eighties an estimated 150 million cartridges had been sold.

Not only does this show the superb ahead-of-its-time design, it also says something for Atari's ingenious sales strategy, which swamped the market.

To back this up it is estimated that one million 2600 systems were sold last year, more than 100,000 of them in the UK.

With companies like Epyx, Activision and CBS supporting it with what seems a continuous stream of new game titles, it's easy to understand why it is so popular. Atari is also writing new games for the 2600 and an ex-director, Nolan Bushnell, has rejoined the company.

His main aim is to create new and more exciting games to challenge today's growing breed of game players. Judging by his success in the past, you never know what's going to come out next.

What is the VCS?

The most common mistake people make when buying the 2600 is that they think it's a programmable home computer, which it is not. It's basically a dedicated box of electronics to be attached to your television to play games plugged into it. You can't attach a disc drive or tape deck, nor can you type in the listings which appear in *Atari User*.

What you CAN do with it is have a lot of fun. It makes an ideal companion for any 8 bit Atari home computer. If dad's busy typing away and the kids want a to play a game, just plug the VCS into the TV and away they go.

And that's the most endearing feature of the 2600, its ease-of-use. You plug a 9v DC adapter into the mains socket, a jack plug into the 2600 and an aerial lead into the television. Tune it in and you can have hours of fun playing your favourite game. *Atari User* will be taking a look at the games available – both old and new – and reviewing them each month as we do the 8 bit computer games.

Each month we will be talking to different suppliers about what cartridges they stock. To start with we've compiled a list from the catalogue of Palan Electronics.

● *Palan Electronics can be contacted at Prestwich House, Brunswick Industrial Park, Brunswick Way, London N11 1HX. Tel: 01-361 2054*

Boxing
Chopper Command
Subterranea
Enduro
Private Eye
H.E.R.O
Freeway
Star Voyager
Sky Voyager
Sky Jinks
Cosmic Ark
Beamrider
Quick Step

Tennis
Laser Gates
Seahawk
Nightmare
Skare Boardin
Ghostbusters
River Raid
Fire Fighter
Wing War
Kung-Fu Master
Riddle of the Sphinx
Atlantis
Moonsweeper

Demon Attack
Skindiver
Space Shuttle
Exocet
Pro-Wrestling
Laserblast
Quest for Quintana Roo
Grand Prix
Megamania
Keystone Kapers
Dragster
Spider Fighter
Seaquest

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California dreamer

Product: California Games
Price: £9.99
Supplier: Epyx/US Gold, Units 2/3 Holford Way, Holford, Birmingham BS 7AX.
Tel: 021-356 3388

"Hey, thrasher! Don'tcha ever wear knee pads?"

"Didja see that? He caught some air on the half pipe! Radical!"

MEET the wonderful world of the half pipe skateboarders – just one of four events on this new California Games cartridge from Epyx. The others are footbag, BMX bike racing and surfing. Together they make a compendium of the most exciting street sports to sweep across America.

You compete for a trophy in each event. The first, footbag, is described as being the most laid back event. Basically it's like juggling with your feet. You have to keep a bag in the air for 90 seconds without using your hands.

I found this to be one of the hardest events, but great fun. If you get your timing right you can keep the bag high in the air – and score extra points for performing stunts.

Next comes half pipe skateboarding. This is one of the most exciting sports to watch and the mixture of strength and coordination can result in some awesome results.

You are given 90 seconds to perform as many stunts as possible. Timing is all-important – if you hold on to the skateboard too long you'll fall off the pipe. Speed is another important factor, if you're not going fast enough you won't be able to perform a jump or a aerial turn.

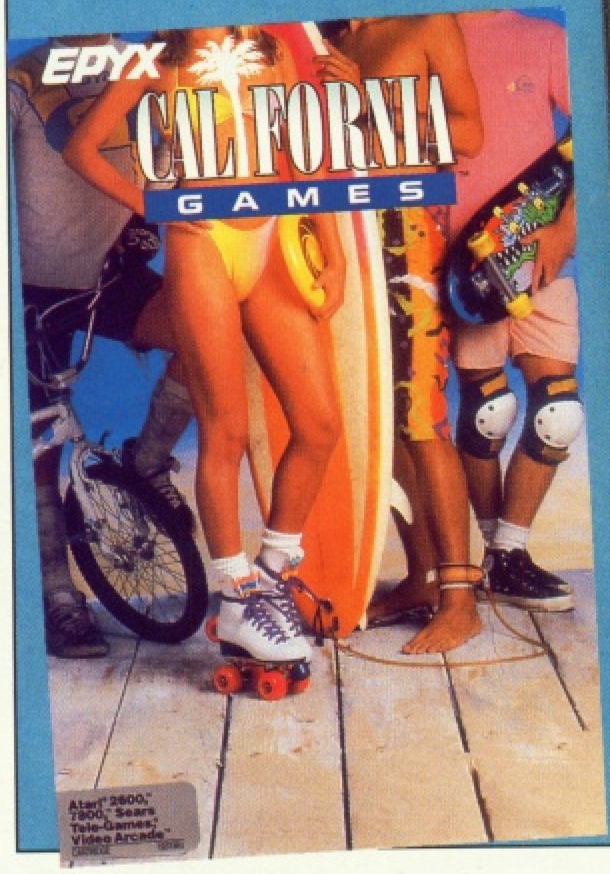
Once you've completed the skateboarding it's time to put your pedalling foot to use and join in the BMX race. The idea is to cover the course – avoiding the obstacles – in the fastest time.

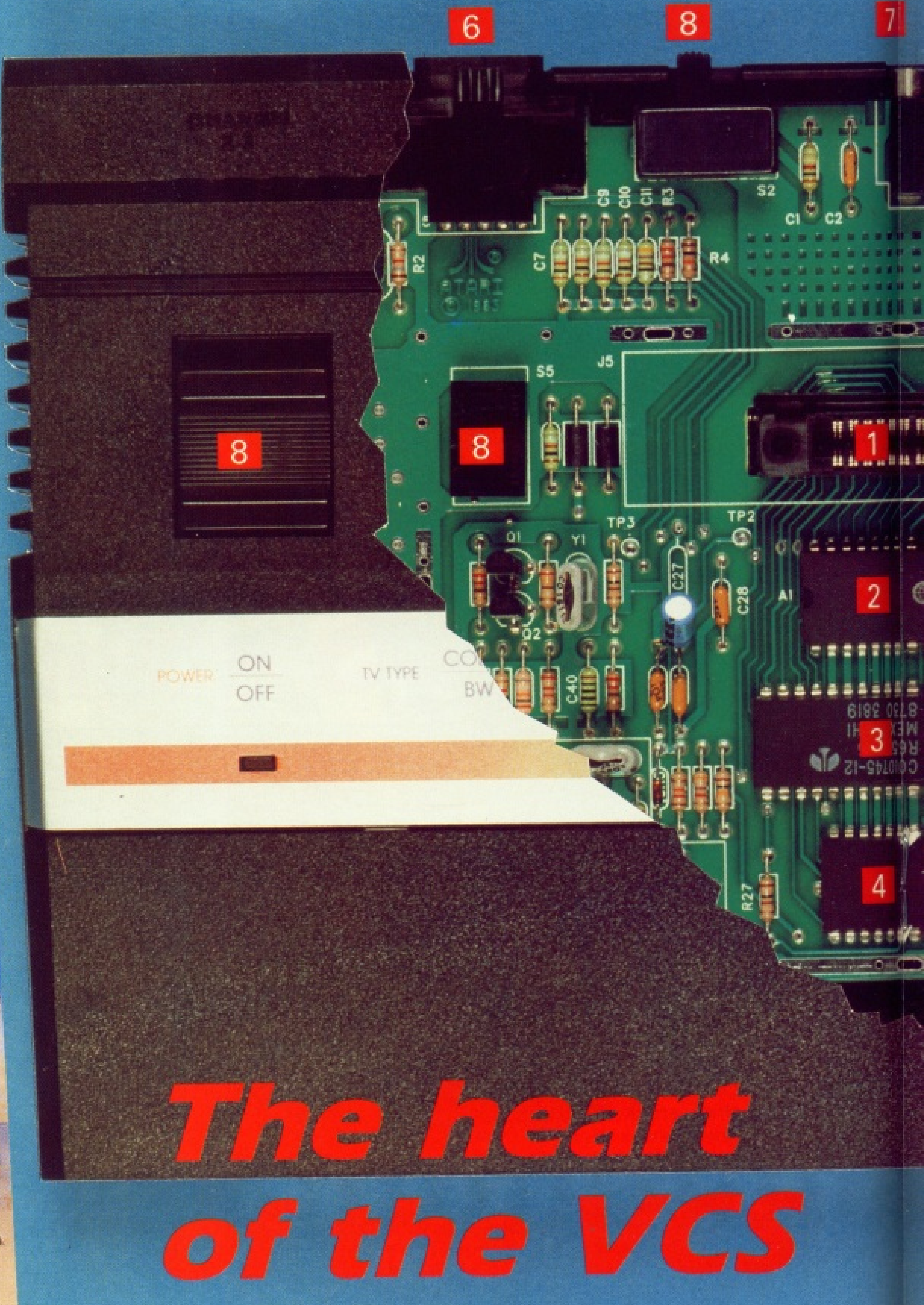
Ramps, logs, tree stumps and trees make life difficult and going too fast can result in rather nasty crashes. Finally comes surfing, which started life as the entertainment of the Hawaiian kings, but now rules the Californian coastline.

The art of competition surfing lies in keeping as near to the curl of the wave as possible and manoeuvreing your board smoothly at high speeds.

I found finishing this event very complicated but I still enjoyed playing it.

Overall, California Games is an excellent cartridge and well worth the £9.99 price tag. Nice graphics and neat sound effects add a wonderful feeling of reality to each game.





The heart of the VCS

The ghost with the most

Product: Ghostbusters
Price: £9.99
Supplier: Atari World, 15 Fennel Street, Manchester.
Tel: 061-834 4941

"HEY, anybody seen a ghost"? Do you remember the superb film with Bill Murray and Dan Akroyd? You do? Well in that case you're bound to enjoy this superb game for the 2600 which is based on the film.

For £9.99 you get paranormal activity, franchise applications, ghost-catching gear, one hit song, slime, laser-stream throwers, a street map, the temple of Zuul and a zillion ghosts. That's what I call value for money.

I remember playing the 8 bit Atari version of Ghostbusters when it first came out and thoroughly enjoyed it. The story line is very simple: Hundreds of evil ghosts and ghouls are heading for the centre of the city in an attempt to turn it into Spook Central. Luckily for the city you and your friends have just decided to form your own Ghostbusters franchise.

The bank has loaned you $5,000 to start the company. It has also told you to earn as much money as you can busting ghosts or it will close you down.

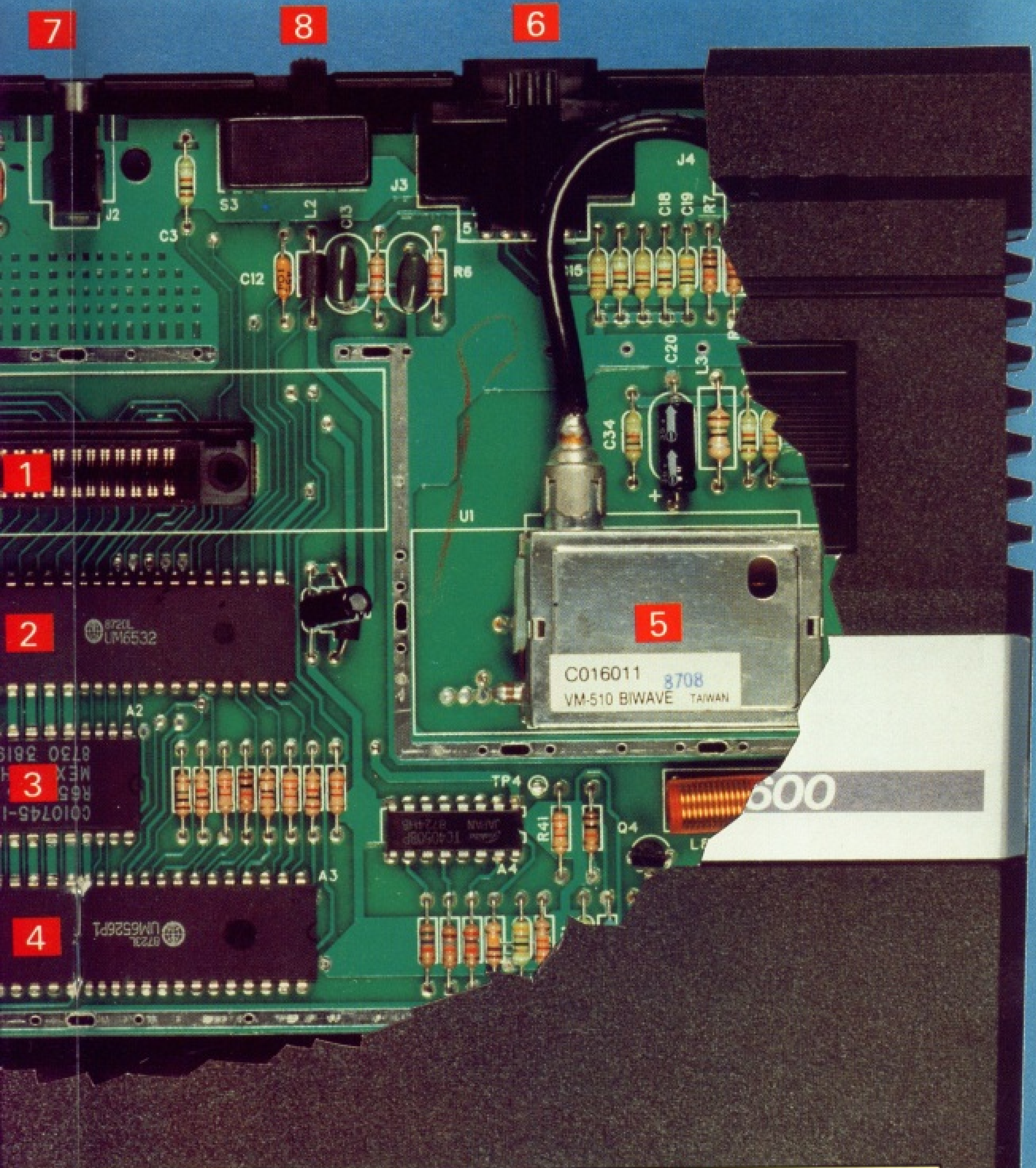
You have until the city's PK energy level reaches 9999. After this point it won't make any difference what happens because the spooks will have taken over.

You must buy all your equipment and a vehicle to transport yourself from one location to the next. Equipment ranges from an image intensifier for $800 to a ghost vacuum for $500. Don't squander your money, think very carefully about what you will need to bust the ghosts.

Having chosen everything you can begin the game. Your ghostbusters symbol will appear on a map of the city and several haunted houses will be revealed. Drive as quickly as you can to the haunted house and deploy your traps. Then activate your laser stream throwers and bingo, you've trapped a ghost. Don't cross the beams – that would mean disaster.

Although it sounds very easy you'll find the game gets harder as it goes along. Considering the 2600 is only a games system the standard of Ghostbusters is superb.

Neat graphics and excellent sound effects give you wonderful value for money. If you haven't got it go and buy it now.



1. Cartridge slot
2. 6532 peripheral interface adapter (PIA)
3. 6507 central processor unit (CPU)
4. TV interface adapter (TIA)
5. UHF modulator
6. Joystick ports
7. DC power input
8. Control switches



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Rom chop

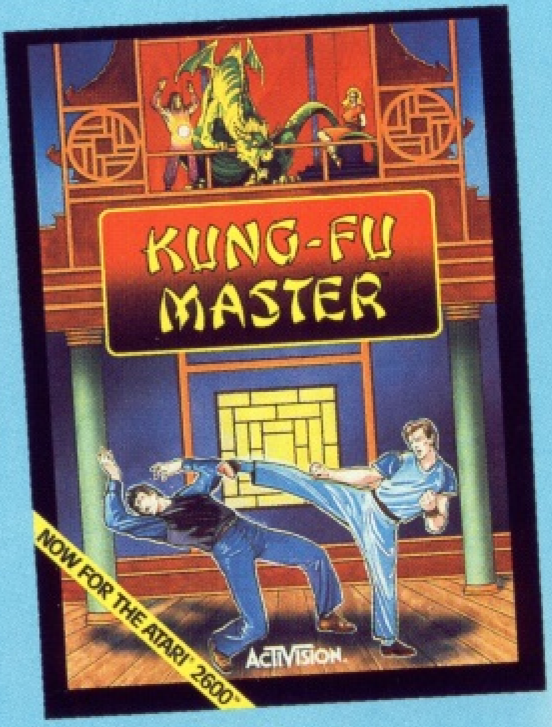
Product: Kung-Fu Master
Price: £9.99
Supplier: Palan Electronics Ltd, Brunswick Industrial Park, Brunswick Way, London N11 1HX.
Tel: 01-361 2054

DEEP within the temple of the evil wizard lies the weeping Princess Victoria. Held against her will she awaits a young hero to rescue her. Charged with the task of retrieving her, you as a Kung-fu master are the only one strong enough to defeat the evil one's minions.

Trained in the art of karate you must penetrate the five treacherous levels and battle with the tireless army of enemy soldiers.

Using your superb martial art skills you oust tough henchmen, knife-throwers, dragons and a few other not-very-nice types.

If you do manage to defeat everybody on a level, you'll automatically move to the next. In the



upper left quarter of the screen you'll see some numbers and bars holding the current status of several game variables.

They are the timer, your and your enemy's energy bar and lives remaining.

Watch your energy bar carefully, because when it runs out so does your life. That of your enemy only indicates the strength of certain soldiers, usually the mean-looking one at the end.

A number of contrasting monsters and soldiers await you – henchmen, knife-throwers, midgets, dragon balls, snake baskets, killer moths and the five biggies. All use different fighting techniques, so be very careful when engaging them.

Of all the people you must fight the biggies are the toughest. They appear at the end of a level and when they hit you they make a large dent in your energy level.

I remember Kung-fu Master from the arcades. The 2600 version may not be as graphically good as the arcade version but it has the atmosphere and playability of the original.

I can recommend this cartridge to anyone who likes sport simulations – if you can call a karate game this.

Our hero

Product: H.E.R.O.
Price: £9.99
Supplier: Palan Electronics Ltd, Brunswick Industrial Park, Brunswick Way, London N11 1HX.
Tel: 01-368 5545

DUTY calls and Roderick Hero – or R. Hero to his friends – is always at your service. Being an outward going, all-around good guy and idol to fledgling heroes around the world, he is always there when trouble looms.

In this superb arcade adventure game you take the role of Roderick and rescue trapped miners lost in the subterranean catacombs of Mount Leone. Decked out with the latest and most up-to-date rescue equipment – personally designed by Roderick – you must enter this underground world and find those lost men.

Several starting levels can be chosen by pressing the game select button. This means you don't have to start on level one all the time. You can jump to level 17 if you want, but be careful it's a deadly serious level. The only way to explain the various pieces of equipment you have is to let Roderick do it himself:

Prop-pack: *"My greatest inspiration, to which I'm very attached. This propeller pack allows me to fly where I wish".*

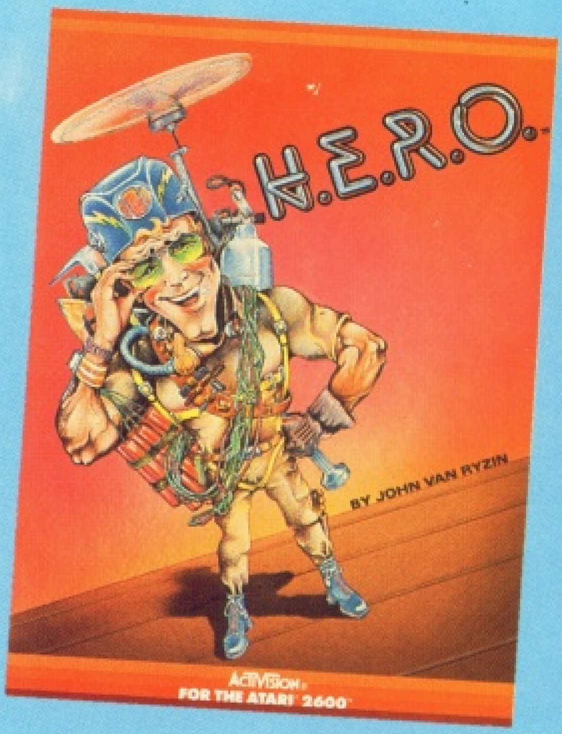
Microlaser Beam: *"The helmet comes equipped with a microlaser beam. With it I can blast vile vermin. The beam can also slice through walls, but this takes time and time costs precious power".*

Dynamite: *"You begin each game and each mine shaft level with six sticks of dynamite, each of which can demolish a small wall".*

A number of possible deaths await as you explore the labyrinth, so you'll have to keep on your toes. Walls which glow red contain magma and will burn you to death if you touch them.

Killer creatures inhabit every tunnel and they tend to be found in the most awkward places – like the bottom of a shaft when you drop down it. Some areas are illuminated by lanterns but if you land on them the lamps will go out and you'll have to continue in the dark.

The graphics are absolutely astounding for a 2600 cartridge – this is the best conversion of a



home computer game I have seen for the VCS. Sound effects are very well done, and when combined with the quality of gameplay you get excellent value for money.

Our thanks to Atari World, Manchester, for supplying the 2600 hardware used in this article.

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ATU9



Getting to the root of the problem

Better disc handling with PHILIP DOBSON's superb program

DCS command syntax

Where DIRNAME is used in the following list of commands, you should define a word or name of your choosing up to eight characters in length. The printer routines have been written for an Atari 1029 and will have to be modified to work with a different printer.

D:\ROOT>	The program prompt. The name displayed between \ and > is always that of the active directory.
CD\DIRNAME	Changes the active directory to that nominated after the \ to the one you want to investigate.
CD\	Returns you to the ROOT directory.
MKDIR\DIRNAME	Used when you wish to add another disc directory to the ROOT disc. Once you have created a directory with this command, label the corresponding disc with the same name. It removes the need to be practiced in the art of small writing in order to squeeze the disc contents on to the disc label. When DCS prompts you to *Insert SOURCE Disc* in this procedure, the disc you wish to take the directory from should be put into drive one.
RMDIR\DIRNAME	Deletes or removes a DIRectory from the root disc.
MFDIR\DIRNAME	Modifies the contents of the nominated directory to be re-written after the original has been altered.
PNDIR\DIRNAME	Prints a hard copy of a nominated directory.
DIR	Displays the contents of the active directory.
DIR\	Displays the contents of all directories filed on the ROOT disc.
FORM	Formats a disc. Ensure it is a blank disc you put in the drive as any data present will have vanished forever after it has been formatted.
QUIT	Causes the program to modify ROOT.DIR if directories have been created or deleted on the ROOT disc. It also exits you from the Root program.

IF you have ever had to take directory after directory of successive discs in order to find a particular file or program – and who has not? – this utility could save you a lot of time, disc changing and the odd expletive as well.

It's designed to help you keep a better track of which files or programs are on which of your discs and does so in a simple way. In principle the program mimics to a limited extent the type of file handling directory found on most Desktop PCs. However, if you have never used one this will mean nothing to you so let me breifly explain it.

The Dos on a PC usually allows you to split a disc into a number of different areas – directories – at will, each area being an independant section from others on the disc. These directories are given a unique name when they are created, usually something meaningful. For example, a directory holding files created by a word processor might be called WORDPRO.

These directories can have files and programs saved in them in the same way we Atarians would use separate discs to save different types of files or programs on.

However, the beauty of a multiple directory system is that in order to find out what is in another directory – in our case on another disc – you'd

PROGRAM BREAKDOWN

20 – 50	Initialises program
70 – 200	Main control loop
230 – 600	Extracts new directory filename, reads in directory from source disc, writes new directory file and modifies an existing directory
620 – 860	Delete an existing directory from Root disc
880 – 1300	Deal with DIR requests from the user
1320 – 1590	Print a hard copy of directory
1610 – 1740	Format disc routines
1760 – 1790	Validate the directory and stop any file duplication
1810 – 1860	Test the Root disc is in the drive when required
1880 – 1900	Tell the user certain operations may only been done at the 'D:\ROOT>" prompt
1920 – 2010	Amend ROOT.DIR file if any creation or deletion of directories takes place
2030 – 2090	Deal with errors which may occur
2110 – 2420	DIMension variables, opening screen and date input routine
2430 – 2510	Decide course of action, access exisiting Root disc or creates a new one
2520 – 2660	Create a new Root disc
2680 – 2800	Access an existing Root disc directory

simply key in a command to change the active directory to the one you wish to interrogate and then enter DIR – the same as option A on DOS 2.5 – to find out what files exist on the disc.

When run, this program will allow you to use one disc as a ROOT directory – one containing all other directories you have chosen to create.

The way DCS does this is to read a directory – not on a commercial disc as this may be unreadable – from a disc of your choice and place a copy of its directory into a file on the disc you use to run the program from. From now on I will refer to this as the Root disc.

Next, by entering one of the various commands available within DCS at the program prompt, you will be able to perform a number of operations as outlined in the command syntax table, including getting a hard copy of any disc's directory.

Printed directories are not only formatted far more neatly than choosing the A - *.*,P: - option on Atari Dos but are also date stamped. If you are using DCS simply to trace a particular file or get a hard copy of a disc's directory, there will be no disc changing involved once the Root disc is in the drive, even though you will be able to access directories for as many discs as are handled by DCS.

However there are times when some disc changing is unavoidable such as adding new directories to the Root disc and deleting or modifying an existing directory record.

Modification of an existing directory has to be performed when a disc's content has been altered, but, as in all these instances, it is a matter of following several on-screen prompts. You can exit from the procedure at any time by pressing a key other than Escape or one required by the program.

The DCS program doesn't have to reside on the disc it uses to store information. What I do is notch the opposite edge of the disc the DCS program is on and use side two to create the Root disc required.

Note that in this case DCS will handle a maximum of 59 directories from other discs. This figure is determined by the limits of the 1050 drive, since it can only handle 64 files a disc. Two Dos files, plus the DCS program file and two files that DCS itself requires, makes up the difference.

The *nuts and bolts* of the program are probably best explained by stepping through what it does the first time it is run.

The opening screen will ask you for the date, which is used to date stamp newly-created directories and also hard copies of any directory you choose. You are then asked if you wish to access an existing root disc or create a new one. In both instances all you are required to do is follow the prompts.

If you are making a new root disc DCS will automatically create the two operating files it requires – ROOT.DIR and DISKNAME.DTA.

The latter file simply contains the word ROOT and is used in the various I/O routines to ensure the correct disc is being used – this prevents the program from writing files to any other disc but the Root disc. The former holds a list of user defined directory names.

Once the program has initialised, the prompt D:&ROOT> will be displayed and the program will wait for you to enter one of the available commands. Like most software which deals with user input/output, DCS is pedantic about syntax, so care should be taken when entering a command.

You can find out from the command table exactly what the syntax for each is and what the command will do. I have also included a command which will format discs in single or enhanced density. Finally, the Disc Cataloging System, has one golden rule you must observe at all times: Key in the QUIT command at the program prompt after you have finished editing a disc. If you don't and you have created or deleted directories, the file – ROOT.DIR – will not be amended and new directories you thought you had created will not be shown.

```
1 REM *****************************
2 REM *  Disk Cataloguing System  *
3 REM *           by              *
4 REM *     Philip Dobson.        *
5 REM *     (c) ATARI USER        *
6 REM *****************************
10 MFD=0:ND=0:DLD=0
20 GOSUB 2110
30 FN$="D:":PR$="D:\ROOT>"
40 ? :? "Remember to ";CHR$(34);"QUIT"
;CHR$(34);" at the end of this session
 if you have deleted, or"
50 ? "created any directories."
60 REM #### MAIN LOOP ####
70 ? :? PR$;:INPUT #16;DSC$:IF DSC$=""
 THEN 190
80 IF LEN(DSC$)<3 THEN 190
90 IF DSC$(1,3)="CD\" THEN GOSUB 780:G
OTO 70
100 IF DSC$="DIR" THEN GOSUB 880:GOTO
70
110 IF DSC$="DIR\" THEN GOSUB 880:GOTO
 70
120 IF DSC$="QUIT" THEN GOTO 1920
130 IF DSC$="FORM" THEN GOSUB 1610:GOT
O 70
140 IF LEN(DSC$)<=6 THEN 190
150 IF DSC$(1,6)="MKDIR\" THEN GOSUB 2
30:GOTO 70
160 IF DSC$(1,6)="RMDIR\" THEN GOSUB 6
20:GOTO 70
170 IF DSC$(1,6)="MFDIR\" THEN MDF=1:G
OSUB 230:GOTO 70
180 IF DSC$(1,6)="PNDIR\" THEN GOSUB 1
320:GOTO 70
190 ? :? "Syntax Error."
200 GOTO 70
210 REM #### WORK OUT NEW DIR NAME ###
220 REM ####   MKDIR  MFDIR        ###
230 IF PR$<>"D:\ROOT>" THEN GOSUB 1880
```

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```
:RETURN
240 DISN$=DSC$(7,LEN(DSC$)):IF LEN(DIS
N$)<8 THEN DISN$(LEN(DISN$)+1)="
  ":REM 8 SPACES
250 GOSUB 1760:IF FLAG AND MDF=1 THEN
270
260 IF FLAG THEN ? :? "Directory Alre
ady exsists.":RETURN
270 IF DISN$="ROOT    " THEN ? :? " R
OOT Directory Not User Alterable.":RET
URN
280 FN$="D:":FN$(LEN(FN$)+1)=DISN$
290 ? :? "Insert SOURCE Disk, Press S
PACE";
300 GET #4,SP:IF SP=27 THEN ? :? :? "O
peration Aborted.":RETURN
310 IF SP<>32 THEN 300
320 REM #### GET DIRECTORY FROM DISK #
330 TRAP 340:OPEN #7,6,0,"D:*.*":EOF=0
:GOTO 350
340 GOSUB 2030:CLOSE #7:? :RETURN
350 TRAP 40000:? :? :? :DR$=""
360 REM ### CHR$  ECS-SHIFT-DELETE
370 FOR I=1 TO 64
380 INPUT #7;F$:L=LEN(F$):? "";F$;
390 IF F$(5,16)="FREE SECTORS" THEN EO
F=1:F$(LEN(F$)+1)=" "
400 DR$(LEN(DR$)+1)=F$:IF EOF THEN POP
 :GOTO 420
410 NEXT I
420 ? "":CLOSE #7
430 ? :? "Insert ROOT Disk. Hit SPACE
";
440 GET #4,KEY:IF KEY=27 THEN ? :? :?
"Operation Aborted.":RETURN
450 IF KEY<>32 THEN 440
460 ? :GOSUB 1810:IF  NOT OK THEN ? :?
 :? "    Operation Aborted.":? :RETURN
470 IF MDF THEN 510
480 REM ### SET FLAG TO RE-WRITE DIR ###
      ### ONLY AND CREATE.        ###
490 RT$(LEN(RT$)+1)=DISN$:RT$(LEN(RT$)
+1)=DATE$:ND=1
500 ? :? "Creating New Directory ";DIS
N$;
510 OPEN #7,8,0,FN$
520 ? :? :? "Writing New Directory.";
530 REM
540 FOR P=1 TO I
550 PRINT #7;DR$(P*17-16,P*17)
560 NEXT P:CLOSE #7
570 ? :? :? "Directory Written."
580 MDF=0:DR$=""
590 ?
600 RETURN
610 REM ####   RMDIR      ########
620 DISN$=DSC$(7,LEN(DSC$))
630 IF DISN$="ROOT" THEN ? :? "Imposs
ible to Delete ROOT Directory.":RETUR
N
640 IF DISN$=PR$(4,LEN(PR$)-1) THEN ?
:? "Cannot Delete Active Directory.":
RETURN
650 IF LEN(DISN$)<8 THEN DISN$(LEN(DIS
N$)+1)="        ":REM 8 SPACES
660 GOSUB 1760:IF  NOT FLAG THEN ? :?
"     Directory Does'nt Exsist.":RETU
RN
670 FN$="D:":FN$(LEN(FN$)+1)=DISN$:F$=
""
680 ? :? "Delete Directory ";FN$(3);"
 [Y]? ";:GET #4,YN:IF YN<>89 THEN ? :R
ETURN
690 GOSUB 1810:IF  NOT OK THEN ? :RETU
RN
700 ? :? :? "Deleting Directory ";
710 TRAP 720:XIO 33,#7,0,0,FN$:GOTO 73
0:REM DELETE FILE
720 GOSUB 2030:? :RETURN
730 TRAP 40000:IF (NP+1)*17>LEN(RT$) T
HEN RT$=RT$(1,NP*17-17):GOTO 750
740 RT$(NP*17-16)=RT$((NP+1)*17-16,LEN
(RT$))
750 ? :? :? "Directory Removed":DLD=1
760 RETURN
770 REM ### CHANGE ACTIVE DIRECTORY ###
780 IF DSC$="CD\" THEN PR$="D:\ROOT>":
RETURN
790 DISN$=DSC$(4,LEN(DSC$))
800 IF DISN$=PR$(5,LEN(PR$)-1) THEN ?
:? "In that Directory Now !":RETURN
```

```
810 DNL=LEN(DISN$):IF DNL<8 THEN DISN$
(LEN(DISN$)+1)="        ":REM 8 SPACES
820 GOSUB 1760:IF FLAG THEN 840
830 ? :? "Directory Doesn't Exsist.":
RETURN
840 DISN$=DISN$(1,DNL)
850 PR$="D:\":PR$(LEN(PR$)+1)=DISN$:PR
$(LEN(PR$)+1)=">"
860 RETURN
870 REM ### DEAL WITH DIRECTORY  ####
880 ALL=0:DISN$=PR$(4,LEN(PR$)-1):IF D
ISN$<>"ROOT" THEN 1060
```

VARIABLES

RT$	Holds the names of each directory file created by the program
PR$	Holds the program prompt including the name of the active directory
DR$	Temporarily holds any directory read from a disc or from a directory file
F$	General purpose string which holds individual filenames
ND	If set, signifies a new directory file has been created. Causes ROOT .DIR to be amended
DLD	As for ND but only for directory files deleted
MFD	If set, tells the program the operation is only a modification to a directory file.

```
890 IF DSC$(LEN(DSC$))="\" THEN ALL=1
900 ? :? "Directory of Files in ";DISN
$:? :?
910 P=0:FOR DR=1 TO LEN(RT$)/17
920 POKE 85,8:? RT$(DR*17-16,DR*17-9);
" ";RT$(DR*17-8,DR*17);" <DIR>"
930 IF P=2 THEN P=0:?
940 NEXT DR:IF P>0 THEN ?
950 ? :? :? DR-1;" Directory(s)."
960 IF ALL THEN ? :? :? "-More-";:GET
#4,SP:? :GOTO 990
970 RETURN
980 REM ### DIRECTORIES FROM ALL ####
990 IF LEN(RT$)/17=1 THEN RETURN
1000 FOR AD=2 TO LEN(RT$)/17
1010 DISN$=RT$(AD*17-16,AD*17-9):IF LE
N(DISN$)<8 THEN DISN$(LEN(DISN$)+1)="
        ":REM 8 SPACES
1020 ? :? "Directory is in ";DISN$:? :
?
1030 GOSUB 1080
1040 ? :? :? "- More -";:GET #4,KEY:IF
 KEY=27 THEN POP :? :RETURN
1050 ? :NEXT AD:? :RETURN
1060 DISN$=PR$(4,LEN(PR$)-1):IF LEN(DI
SN$)<8 THEN DISN$(LEN(DISN$)+1)="
        ":REM 8 SPACES
1070 ? :? "Directory is in ";DISN$:?
1080 FN$="D:":FN$(LEN(FN$)+1)=DISN$
1090 DR$="":EOF=0:P=0
1100 TRAP 1110:OPEN #3,4,0,FN$:TRAP 40
000:GOTO 1120
1110 GOSUB 2030:CLOSE #3:? :RETURN
1120 FOR DR=1 TO 65
1130 INPUT #3;F$:DR$(LEN(DR$)+1)=F$
1140 IF F$(5,10)="FREE S" THEN EOF=1
1150 IF EOF THEN POP :GOTO 1170
1160 NEXT DR
1170 CLOSE #3
1180 IF DR=66 THEN DR=DR-1
1190 IF PN THEN RETURN
1200 P1=0:P=0:POKE 82,1:?
1210 REM #### DISPLAY DIR CONTENTS ####
1220 FOR PR=1 TO DR-1:P1=P1+1
1230 ? DR$(PR*17-16,PR*17-7);" ";DR$(P
R*17-6,PR*17);:P=P+1:IF P=1 THEN ? " |
";
1240 IF P=2 THEN P=0:?
1250 IF P1=34 THEN P1=0:? :? "- More -
";:GET #4,SP:? :?
1260 NEXT PR
1270 IF P>0 THEN ?
1280 POKE 82,2:? :? DR$(PR*17-16,PR*17
);"  ";PR-1;" File(s)."
1290 IF ALL THEN RETURN
1300 RETURN
1310 REM ####  PNDIR  ##########################
1320 IF LEN(DSC$)<=6 THEN ? :? "Nomin
ate Directory Please.":RETURN
1330 IF PR$<>"D:\ROOT>" THEN GOSUB 188
0:RETURN
1340 DISN$=DSC$(7,LEN(DSC$)):IF LEN(DI
SN$)<8 THEN DISN$(LEN(DISN$)+1)="
        ":REM 8 SPACES
1350 GOSUB 1760:IF  NOT FLAG THEN ? :?
 "Invalid Directory.":RETURN
1360 ? :? "Ready Printer - Press Any K
ey ";:GET #4,YN:?
1370 TRAP 1380:OPEN #5,8,0,"P:":GOTO 1
390
1380 GOSUB 2030:CLOSE #5:? :RETURN
1390 ? :? "Printing Directory ";DISN$;
1400 ? #5:? #5:? #5:? #5;"
          DISK CATALOGUING UTILITY
.":? #5:? #5
1410 IF DISN$(1,4)="ROOT" THEN GOTO 15
20
1420 PN=1:GOSUB 1080:PN=0:IF DR$="" TH
EN ? :CLOSE #5:RETURN
1430 ? #5;"     Directory of Files on
Disk named :";DISN$;"   As of ";DATE$:
? #5
1440 P=0:FOR PR=1 TO LEN(DR$)/17-1
1450 ? #5;"          ";DR$(PR*17-16,
PR*17-7);" ";DR$(PR*17-6,PR*17);:P=P+1
1460 IF P=2 THEN P=0:? #5
1470 NEXT PR:? #5:? #5
1480 ? #5;"     ";DR$(PR*17-16,PR*17);
"        ";PR-1;"  Files on Disk"
1490 ? :CLOSE #5
1500 RETURN
1510 REM ###SET UP TO PRINT ROOT DIR ###
1520 ? #5;"   Directory of files in ";
DISN$;"  As of ";DATE$:? #5
1530 P=0:FOR RD=1 TO LEN(RT$)/17
1540 ? #5;"          ";RT$(RD*17-16,RD*1
7-9);"  ";RT$(RD*17-8,RD*17);"  <DIR>"
;:P=P+1
1550 IF P=2 THEN P=0:? #5
1560 NEXT RD:? #5:? #5
1570 ? #5;"   ";64-RD;"  FILES AVAILAB
LE.    ";RD-1;" Directories on File."
:? #5
1580 ? :CLOSE #5
1590 RETURN
1600 REM ####  FORMAT DISKS ##############
1610 ? :? "Format Single or Double S/D
 ";
1620 GET #4,DN:IF DN=83 OR DN=68 THEN
1650
1630 IF DN=27 THEN RETURN
1640 GOTO 1620
1650 ? :? :? "Insert BLANK Disk. Pres
s SPACE";
1660 GET #4,SP:IF SP=27 THEN ? :RETURN

1670 IF SP<>32 THEN 1660
1680 ? :? :? "Formatting Disk ";
1690 IF DN=68 THEN FR=34
1700 IF DN=83 THEN FR=0
1710 TRAP 1730:XIO 253,#7,FR,0,"D1:":R
EM FORMAT
1720 ? :? :? "Disk Formatted";:GOTO 17
40
1730 GOSUB 2030
1740 TRAP 40000:RETURN
1750 REM ### VALIDATE DIRECTORY ####
1760 FLAG=0:FOR I=1 TO LEN(RT$)/17
1770 IF RT$(I*17-16,I*17-9)=DISN$ THEN
 FLAG=1:POP :NP=I:GOTO 1790
1780 NEXT I
1790 RETURN
1800 REM ###CONFIRM ROOT DISK IN DRIVE#
1810 OK=0
1820 TRAP 1850:OPEN #3,4,0,"D:DISKNAME
.DTA":INPUT #3;F$:CLOSE #3
1830 TRAP 40000:IF F$="ROOT" THEN OK=1
:RETURN
1840 ? :? "   Unidentifiable Disk in
Drive.":RETURN
1850 GOSUB 2030:CLOSE #3
1860 RETURN
1870 REM ### NOT IN ROOT DIRECTORY ####
1880 ? :? "   All Directory Operation
s must be"
1890 ? "   performed from D:\ROOT>"
1900 RETURN
1910 REM ##### QUIT ########################
1920 IF  NOT ND AND  NOT DLD THEN 2010
1930 GOSUB 1810:IF OK THEN 1950
1940 ? :? :GOTO 70
1950 ? :? "Ammending ROOT Directory ";
1960 CLOSE #4:OPEN #4,8,0,"D:ROOT.DIR"
1970 FOR WR=1 TO LEN(RT$)/17
1980 F$=RT$(WR*17-16,WR*17)
1990 ? #4;F$
2000 NEXT WR:CLOSE #4
2010 ? "":END
2020 REM ### ERROR HANDLING ROUTINE ###
2030 TRAP 40000:ER=PEEK(195)
2040 IF ER=144 THEN ? :? :? "Drive n
ot Responded.";
2050 IF ER=170 THEN ? :? :? "Wrong D
isk in Drive ";
2060 IF ER=173 THEN ? :? :? "Disk I/
O Error.";
2070 IF ER=138 THEN ? :? :? "Device
not Available ";
2080 IF ER=162 THEN ? :? :? "Disk Fu
ll";
2090 RETURN
2100 REM ******OPENING SCREEN*******
2110 DIM DR$(65*13),RT$(65*18),F$(17),
DISN$(8),FN$(14),DSC$(15),PR$(12),DATE
$(9),MON$(4)
2120 GRAPHICS 0:POKE 16,64:POKE 53774,
```

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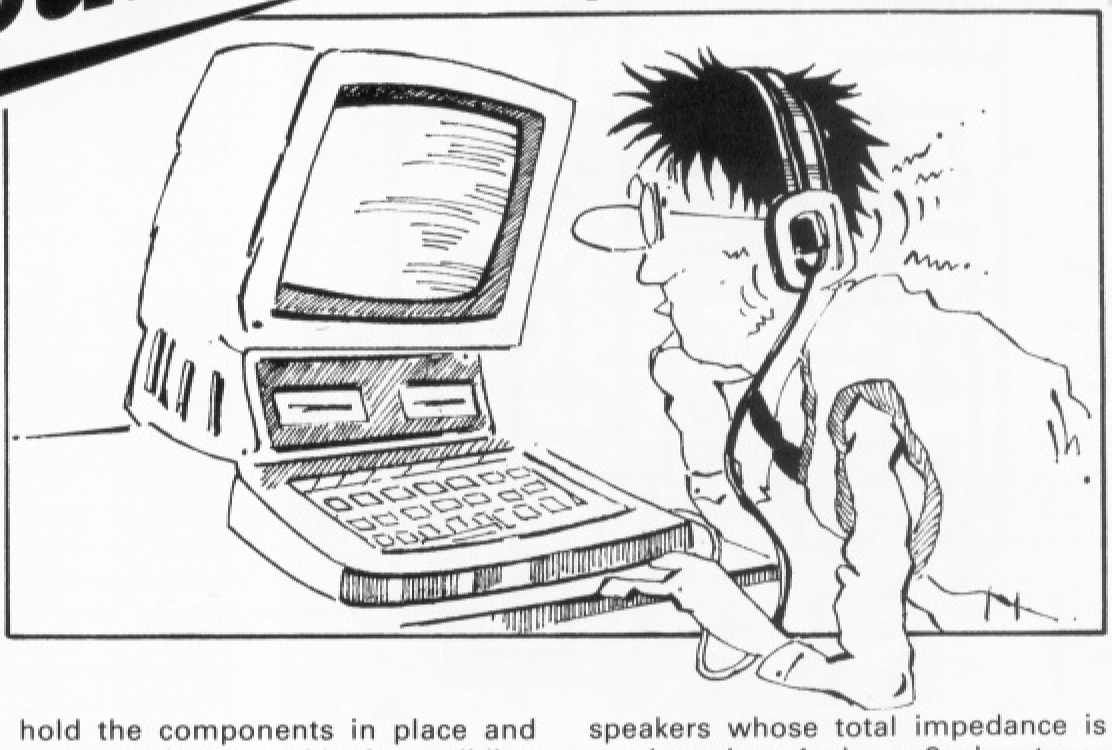
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```
64:REM NEUTRALISE BREAK KEY
2130 OPEN #4,4,0,"K:":POKE 702,64:REM
POKE SETS KEYBOARD TO UPPER-CASE ONLY
2140 POKE 712,96:POKE 710,96:POKE 709,
206
2150 POKE 559,0:POKE 82,1:? "K↓▄▄▄▄▄▄
▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▌"
2160 FOR I=1 TO 20
2170 ? "▌
      ▐":REM 37 SPACES
2180 NEXT I
2190 ? "▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀
▀▀▀▀▀▀▀"
2200 POKE 82,4:POKE 84,3:?
2210 ? "_______________________________
_"
2220 ? "▄▄▄   ▄▄▄   ▄▄▄          Disk
▐":REM Character before closing " is
INVERSE CONTROL Y
2230 ? "▀  ▀  ▀     ▀      Cataloguing
▐"
2240 ? "█ █ █     ▄▄▄         System
▐"
2250 ? "█ █ █       █           by
▐"
2260 ? "▀▀▀   ▀▀▀   ▀▀▀       Phil Dobson
▐"
2270 ? "‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾
‾"
2280 ? :? :POKE 85,9:? "Todays Date 01
 Jan 87"
2290 POKE 84,18:? "Enter Date [01/01/0
1]   ";:POKE 559,34:DATE$=""
2300 POSITION 38,18:? "←←←←←←←←←←←←";:
INPUT #16;DATE$
2310 IF DATE$(3,3)="/" AND DATE$(6,6)=
"/" THEN 2330
2320 GOTO 2290
2330 TRAP 2290
2340 IF VAL(DATE$(1,2))>31 THEN 2290
2350 MON=VAL(DATE$(4,5)):IF MON>12 OR
MON<1 THEN 2290
2360 DATE$(9)=DATE$(8,8):DATE$(8,8)=DA
TE$(7,7):DATE$(7,7)=" "
2370 RESTORE :FOR I=1 TO MON:READ MON$
:NEXT I
2380 DATE$(3,3)=" ":DATE$(4,6)=MON$
2390 POSITION 21,13:? DATE$
2400 POKE 84,18:? "Confirm Date [Y]
";
2410 POSITION 38,18:? "←←←←←←←←←←←←←←←
←";:GET #4,YN:IF YN<>89 THEN ? :GOTO 2
290
2420 TRAP 40000
2430 POKE 82,2:FOR I=2 TO 19
2440 POSITION 2,I:? "
                 ":REM 35 SPACES
2450 NEXT I
2460 POSITION 5,8:? "Access Existing D
irectory  A"
2470 POSITION 5,12:? "Create New Root
Directory  C←";
2480 GET #4,CA
2490 IF CA<>65 AND CA<>67 THEN 2480
2500 FOR I=8 TO 13:POSITION 2,I:? "
                  ":NEXT I
2510 IF CA=65 THEN 2680
2520 POKE 82,5
2530 POSITION 5,5:? "Format New Root d
isk [Y/N] ";:GET #4,YN:IF YN<>89 AND Y
N<>78 THEN 2420
2540 IF YN=89 THEN ? :GOSUB 1610:IF DN
=27 THEN 2420
2550 IF YN<>78 THEN 2580
2560 ? :? :? "Insert FORMATTED Disk":?
 :? "▶Press Any Key ";:GET #4,YN
2570 REM ### CREATE OPERATING FILES ####
2580 ? :? :? "Creating Operating Files
 ";:RT$="ROOT     ":RT$(LEN(RT$)+1)=DAT
E$
2590 TRAP 2600:GOTO 2620
2600 GOSUB 2030:GOTO 2420
2610 REM
2620 OPEN #7,8,0,"D:ROOT.DIR":? #7;RT$
:CLOSE #7
2630 OPEN #7,8,0,"D:DISKNAME.DTA":? #7
;"ROOT":CLOSE #7
2640 ? :? :? "Press any key ";:GET #4,
YN
2650 POKE 82,2:? "K↑↑"
2660 RETURN
2670 REM #### ACCESS EXISTING DISK ####
2680 POSITION 5,5:? "Insert ROOT Disk
in Drive "
2690 ? :? "▶Press Any Key ";:GET #4,YN
:IF YN=27 THEN 2420
2700 GOSUB 1810:IF OK THEN 2740
2710 FOR D=1 TO 150:NEXT D
2720 ? :? "↑
    ":REM 28 SPACES
2730 GOTO 2680
2740 TRAP 2780:OPEN #7,4,0,"D:ROOT.DIR
"
2750 FOR I=1 TO 64
2760 INPUT #7;F$:RT$(LEN(RT$)+1)=F$
2770 NEXT I:CLOSE #7
2780 TRAP 40000:IF PEEK(195)<>136 THEN
 ? :? "Unexspected Disk Error ":END
2790 POKE 82,2:? "K↑↑"
2800 RETURN
2810 DATA Jan,Feb,Mar,Apr,May,Jun,Jul,
Aug,Sep,Oct,Nov,Dec
```

1 CAJ (W)	310 97F (P)	670 52Y (4)	1030 SHO (X)	1390 WSM (7)	1750 E4N (S)	2110 RU9 (T)	2470 34S (Y)
2 CAK (3)	320 D3U (U)	680 8NE (9)	1040 631 (Q)	1400 6RF (N)	1760 1GC (H)	2120 TCJ (5)	2480 QLX (W)
3 CAL (V)	330 K96 (L)	690 109 (8)	1050 FUD (N)	1410 ADO (O)	1770 MF8 (V)	2130 XAQ (E)	2490 2EH (Y)
4 CAM (4)	340 SWT (9)	700 NK8 (5)	1060 KYD (H)	1420 CAV (T)	1780 P3S (W)	2140 1AP (6)	2500 HKL (3)
5 CAN (W)	350 PNE (P)	710 EX4 (R)	1070 GUG (7)	1430 DPE (P)	1790 WRK (S)	2150 C4P (Q)	2510 AQA (7)
6 CAP (7)	360 DLU (S)	720 7RS (H)	1080 W4C (S)	1440 25J (C)	1800 DXN (U)	2160 2MH (5)	2520 Q3J (R)
10 8NU (U)	370 TYM (P)	730 N9R (8)	1090 5T8 (A)	1450 U97 (D)	1810 E5Y (3)	2170 XTR (K)	2530 3VE (V)
20 R7K (X)	380 WXF (L)	740 FJ9 (6)	1100 VFT (4)	1460 CX4 (W)	1820 HCN (2)	2180 NCT (L)	2540 5MK (8)
30 G55 (C)	390 HYQ (J)	750 YTC (M)	1110 64Y (H)	1470 7G4 (P)	1830 RRD (C)	2190 1DO (P)	2550 F2L (1)
40 14R (W)	400 S15 (J)	760 RXC (S)	1120 7FY (O)	1480 WMS (J)	1840 F35 (6)	2200 J7H (D)	2560 ANS (9)
50 GM6 (5)	410 NL4 (P)	770 DQY (K)	1130 76U (C)	1490 YH6 (K)	1850 EDJ (M)	2210 TOR (H)	2570 EOP (G)
60 CP6 (W)	420 WHQ (U)	780 SFG (T)	1140 Y67 (J)	1500 VXK (N)	1860 WPK (M)	2220 017 (5)	2580 Q91 (S)
70 Q02 (K)	430 E1J (1)	790 Q05 (S)	1150 YQD (E)	1510 DMN (J)	1870 EDN (Q)	2230 17F (Q)	2590 9Q9 (M)
80 E4T (Y)	440 7N1 (Q)	800 60X (3)	1160 QGS (5)	1520 EHG (W)	1880 10E (M)	2240 647 (G)	2600 E28 (C)
90 F2T (R)	450 FXY (N)	810 PDP (4)	1170 S5T (X)	1530 WVV (P)	1890 9PP (J)	2250 VH4 (V)	2610 DRP (E)
100 DXS (W)	460 UQX (3)	820 LNH (L)	1180 M83 (7)	1540 DXD (W)	1900 WFK (H)	2260 FYP (C)	2620 NF5 (2)
110 91E (8)	470 5J7 (C)	830 OX2 (V)	1190 GR3 (E)	1550 DO4 (D)	1910 E4N (K)	2270 SDV (P)	2630 4VY (D)
120 RDN (2)	480 DUV (4)	840 AQ5 (X)	1200 F1G (S)	1560 774 (5)	1920 CFF (S)	2280 9YG (C)	2640 Q8R (L)
130 E2M (8)	490 7C2 (1)	850 2VK (H)	1210 D8N (X)	1570 301 (A)	1930 RTK (H)	2290 JOP (3)	2650 5EG (Y)
140 PK4 (E)	500 P91 (S)	860 RXD (K)	1220 XWF (F)	1580 YK6 (9)	1940 YCY (M)	2300 9CL (7)	2660 WFL (U)
150 TCD (4)	510 37L (8)	870 DRO (P)	1230 1VV (H)	1590 WHK (D)	1950 R79 (M)	2310 TL8 (A)	2670 E4P (V)
160 TV8 (G)	520 VSU (7)	880 CLK (K)	1240 CF9 (J)	1600 DPN (9)	1960 34J (R)	2320 PLE (1)	2680 PG1 (O)
170 4EY (W)	530 D7W (D)	890 864 (3)	1250 GD1 (W)	1610 LD3 (K)	1970 WPH (J)	2330 PQV (L)	2690 VDJ (2)
180 S48 (M)	540 TLG (Q)	900 7WM (Q)	1260 RCS (J)	1620 EUN (1)	1980 LH3 (S)	2340 YUU (1)	2700 RDC (7)
190 P1G (T)	550 NWE (8)	910 OAQ (X)	1270 4NJ (W)	1630 KCO (H)	1990 TC3 (W)	2350 12N (E)	2710 KNY (X)
200 P58 (F)	560 6WL (2)	920 W2E (4)	1280 C50 (E)	1640 Q1V (C)	2000 6NL (U)	2360 C97 (Q)	2720 MWX (D)
210 CYT (3)	570 GEV (W)	930 73P (D)	1290 JWT (F)	1650 WND (L)	2010 QTC (8)	2370 X89 (D)	2730 Q8W (N)
220 D3T (G)	580 VHU (R)	940 G16 (C)	1300 VPK (A)	1660 9JL (A)	2020 D2P (E)	2380 R66 (9)	2740 4YU (5)
230 TD7 (K)	590 DE5 (C)	950 OPR (W)	1310 DDN (E)	1670 FFD (4)	2030 MYA (M)	2390 R69 (7)	2750 3TM (K)
240 Q30 (W)	600 R6A (4)	960 E6V (6)	1320 S89 (L)	1680 7GH (E)	2040 Y24 (9)	2400 AFW (H)	2760 CXV (R)
250 5VP (R)	610 CYX (E)	970 S2E (5)	1330 1S2 (D)	1690 F7P (W)	2050 PRF (M)	2410 V6U (N)	2770 1XJ (8)
260 VXS (8)	620 P4A (D)	980 DV1 (7)	1340 EXQ (T)	1700 ENK (T)	2060 GVS (J)	2420 PWD (N)	2780 VG8 (M)
270 XDO (W)	630 3RL (J)	990 SJE (R)	1350 P71 (1)	1710 OYE (K)	2070 V94 (9)	2430 HJL (G)	2790 5SG (U)
280 X57 (1)	640 P10 (7)	1000 RJO (A)	1360 CPW (D)	1720 ROO (J)	2080 VUV (U)	2440 UW8 (5)	2800 WAL (S)
290 HV1 (G)	650 9KH (E)	1010 XF8 (W)	1370 5UF (F)	1730 TCR (K)	2090 VVL (Y)	2450 NJT (5)	2810 E6J (Q)
300 LKK (Y)	660 86V (T)	1020 H9U (6)	1380 6U3 (N)	1740 A51 (W)	2100 D2P (T)	2460 Y34 (Y)	

Sounds spectacular

Improve the sound quality of your Atari with LEN GOLDING's superb D-I-Y gadget



MODERN games make increasingly impressive use of sound, but unfortunately the average small TV can't reproduce computer audio at its best. The trouble is that TV speakers are usually quite small low quality units and poor at handling bass frequencies. Consequently explosions tend to sound more like waves on the shore, while background music lacks any body and presence.

It's even worse with monitors, especially the cheaper ones, where the sound output is often too tinny for anything other than beeps and whistles. In fact, some inexpensive monitors designed originally for the communications field don't contain an audio channel at all.

This gadget will let your computer drive a large hi-fi speaker to give you better quality sound, or to produce a realistic stereo effect in conjunction with the existing TV system. It will also drive certain types of headphone, so you can blow your mind without upsetting the neighbours.

The amplifier plugs into the monitor socket on your 800, XL or XE console – sorry 400 users – and will work in addition to the TV or monitor's existing sound system.

Figure I shows the circuit, which is based upon the TBA820 power amplifier chip. It's particularly suitable for computer applications, since it will work on five volts and takes relatively little current. You can power it by battery or even from the computer's own internal supply.

The gadget is very easy to build, using a printed circuit board supplied by RH Design. Alternatively you could etch your own PCB from the foil pattern in Figure II. Because all the component connections are already made for you on the board, you need only plug in the various components and solder them to the tracks under their mounting holes. It could hardly be easier – this gadget is a good project for beginners.

The component layout is shown in Figure III. Start by soldering the three resistors and the IC socket, all of which can go either way round. A good tip is to insert the components, then invert the whole assembly on to a foam pad 25mm or more thick. This will help hold the components in place and prevents the assembly from sliding around on the table while you're soldering it.

The capacitors go in next. C3 and C4 can go either way round, but C1, C2 and C5 must be fitted as shown. The negative side of these polarised capacitors is marked by black chevrons and – usually – the number 0. The 5-pin DIN sockets, volume control (VR1) and PCB terminal blocks are soldered last.

The speaker can be connected either way round to the two terminals marked *s* in Figure III. The amplifier will drive a speaker or combination of speakers whose total impedance is not less than 4 ohms. 8 ohm types work satisfactorily, but produce slightly less volume with this particular amplifier.

Most hi-fi speakers are suitable, and the ones designed for car radios will also give satisfactory results.

Now we have to think about a power supply, and there are several options open here. You could, of course, use a properly stabilised mains power pack, but these are expensive and introduce an extra mains lead to fall over. Ni-cad batteries are suitable – four C size cells

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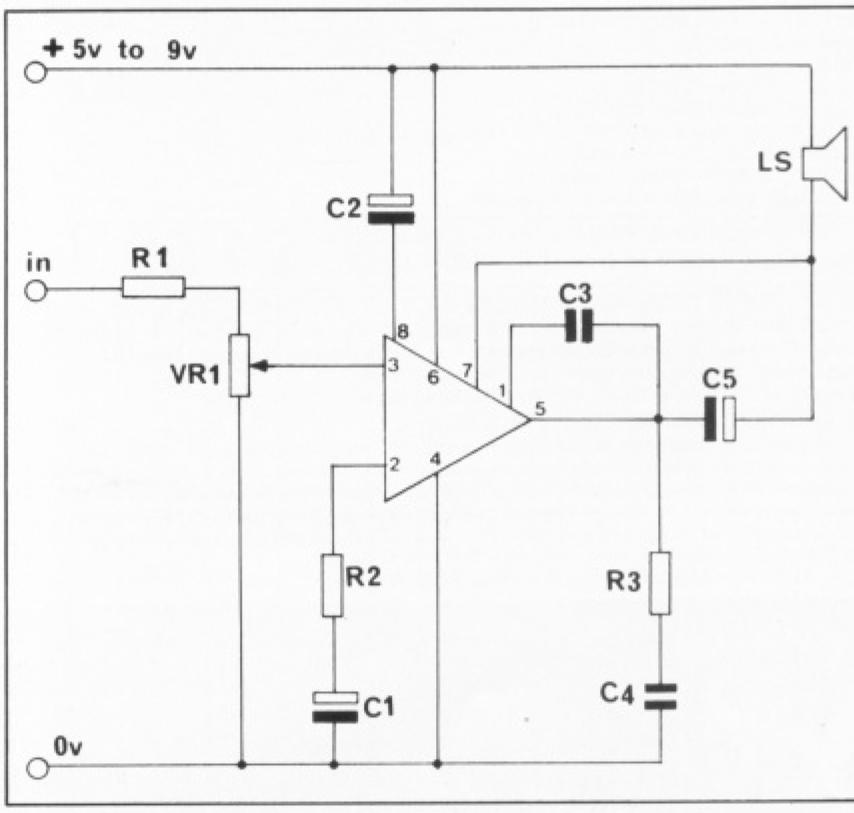


Figure I: The amplifier circuit

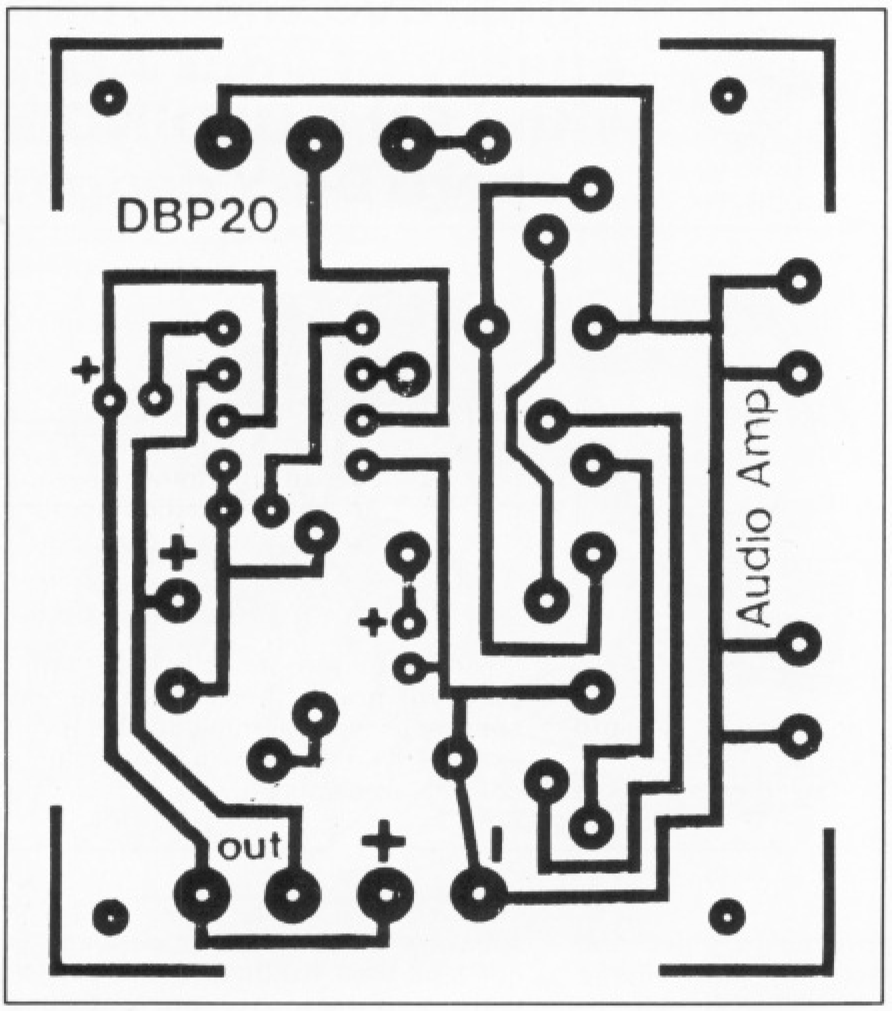


Figure II: The foil pattern (not actual size)

◀ **From Page 37**

will produce an adequate voltage and will last about 20 hours before they need recharging. Even a 9v PP3 type will give several hours continuous listening.

One thing you must never do is to try taking power from inside the TV or monitor, for three good reasons:

- A TV tube employs extremely high voltages
- The chassis is not usually isolated from the mains.
- You can't subscribe to *Atari User* from the afterlife.

The simplest and cheapest option is to draw power from the computer itself via a joystick port. You can't get quite so much volume using this method, but there's still enough for comfortable listening. Cut the joystick lead to length, and strip back about 10cm of the outer black sheath. Now use some kind of continuity tester – a bulb and battery arrangement will do – to identify the two leads which go to pins seven and eight.

Figure IV shows the pins as they appear when you're looking into the moulded plug. Pin seven carries the

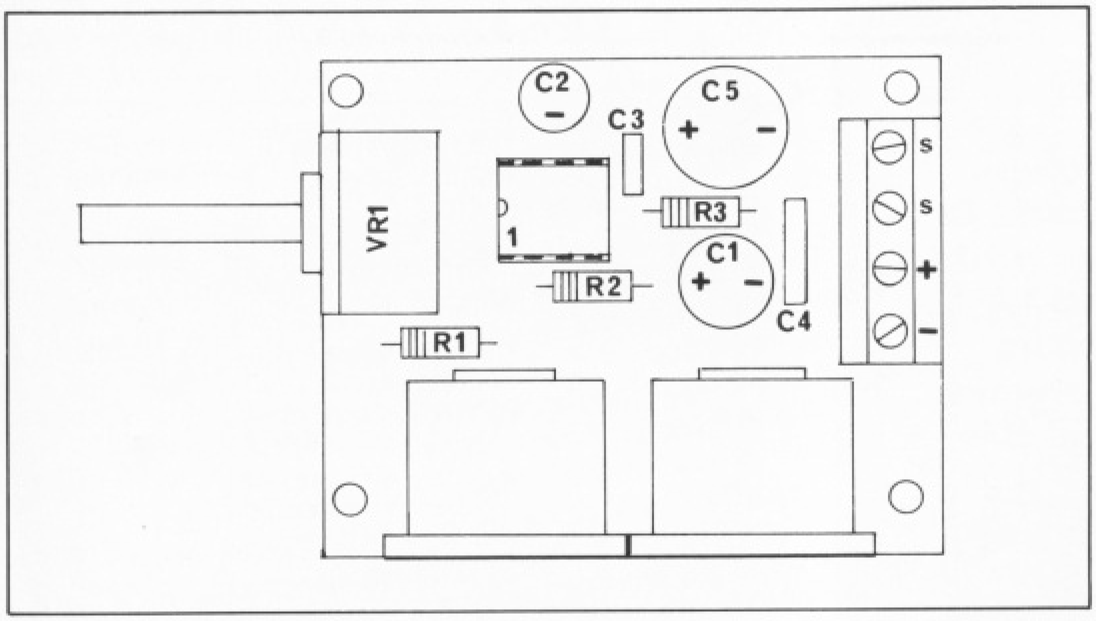


Figure III: Component layout

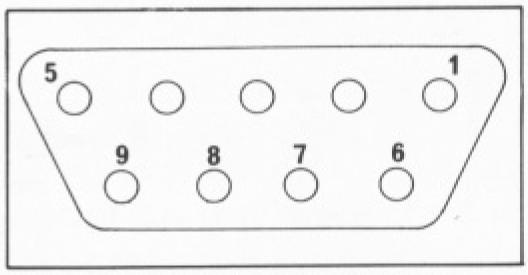


Figure IV: Pin numbering – view into the end of the joystick extension lead

positive 5v supply and pin eight the negative. It's very important not to reverse these connections, nor to let them touch each other when your gadget is plugged in to the computer.

With this method you will need to de-couple the power supply, otherwise all you'll get is an unpleasant buzz. Do this by fitting a 220 ufd capacitor across the supply lines at the connecting block, taking care that the 0v side (marked with chevrons and 0) goes to the 0v line.

When everything appears to be wired correctly, insert the amplifier chip, ensuring that it goes the right way round and that all eight pins sit firmly into their sockets. Turn the volume control to its half-way position and connect the power – you should now hear a low hum from the speaker.

If not, disçonnect power at once, and check all your joints making sure you haven't missed soldering any and that no stray blobs or threads of solder have accidentally bridged any tracks.

Also double-check that the positive and negative supply wires are fitted firmly and the right way round. When all is well, plyg one end of the 5-pin to 5-pin cable into one of the PCB's 5-pin sockets – it doesn't matter which – and the other end into your copmputer's monitor jack. If you're using a monitor as opposed to a TV, plug the monitor lead into the other 5-pin socket on the PCB.

Any sound produced by your computer will now be heard from the new speaker as well as from your TV. If you like this stereo effect, use the volume controls to balance the channels, otherwise turn the TV volume off. Incidentally, you may get a slightly better stereo effect if you reverse the speaker connections at the PCB. Try it and see.

It only remains to mount the whole assembly in a suitable box and fit some kind of output socket for the speaker. A 3.5mm jack socket is suitable and will accept many types of headphone as an alternative to speakers. However, most headphones these days are stereo types, so you'll need a stereo-to-mono converter plug if you want sound in both ears.

Also you'll find that the lower the headphone impedance the better the sound quality and the lower the background hum.

TIN SOLDERS

It's a while since we said anything about soldering technique so if you're new to the game here are a few tips. Choose a modern electric soldering iron rated between 15 and 25 watts, with a 1mm or 2mm bit. Also use 22 SWG multicore solder if you can get it – it is thinner than the more common 18 SWG type and less likely to form untidy blobs.

When the iron is hot enough, tin the bit by melting a small amount of solder on to its working surface.

Make sure the component you are soldering is correctly inserted and sitting tightly up to the board surface, then apply the soldering iron so that it touches both the component lead and the PCB track simultaneously. Now touch the solder to the lead/track junction – not to the soldering iron – and watch until it flows smoothly around both lead and track.

You're unlikely to damage any of the components in this project by excess heat, so don't be in too great a hurry to remove the iron. A good solder joint can be recognised on sight – it has a triangular profile, not a blob or hemisphere, and it should be smooth and shiny.

If you've never done any electronics soldering before, it's worth spending an hour or so practising on an odd scrap of Veroboard – all electronics shops sell this – before tackling the PCB.

Parts required for the audio amplifier

Component	Description	M.E.S. Code
R1	22k	**M22K**
R2	120k	**M120R**
R3	1 ohm	**M1R**
VR1	10K Lin. Potentiometer	**FW02C**
C1	100 mfd 10v	**FF10L**
C2	47 mfd 25v	**FF08J**
C3	220 pF (marked n22)	**WX60Q**
C4	0.22 mfd Polyester layer	**WW45Y**
C5	220 mfd 16v	**FF13P**
IC1	TBA820M	**WQ63T**
	8-pin DIL IC socket	**BL17T**
	4-way terminal block	**RK73Q**
	Two 5-pin 180 degree DIN sockets	**YX91Y**

All components are available from M.E.S. P.O. Box 3, Rayleigh, Essex, SS6 8LR. Tel: 0702 552911

Printed circuit board (order code DBP20) Price £3
Joystick extension lead (order code AT111) Price £2.99

Available from R.H. Design, 137 Stonefall Avenue, Harrogate, North Yorkshire, HG2 7NS Tel: 0423 508359

Prices include VAT and postage

ATARI USER Classifieds

Has upgrading your computer given you hardware you no longer need? Or have changing interests left you with unwanted software? Then THIS is the place to advertise your surplus items. *Atari User* readers are always on the lookout for a bargain and this is the first place they look!

Classified advertisements will be accepted under the following conditions:

- This service is EXCLUSIVELY for the use of private readers. No trade ads will be allowed.
- To avoid encouraging software piracy, all ads will be carefully vetted before they are accepted.
- Ads can only be accepted on this form (or a photocopy of it).
- There is no maximum to the number of words you include in your ad. If there is insufficient room on the form, continue on a separate sheet of paper.
- The cost is 20p per word, with a minimum of 10 words.
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An added bonus!

Your advert will also be automatically displayed on MicroLink, the electronic mail service operated in association with Telecom Gold. This means it will be seen by thousands of computer enthusiasts who can send an instant response.

- Various utility discs and cassette games. All at cheap prices Tel: Peter Solihill 743 8653.
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- 1050 drive, Xmas present, fully boxed, all manuals, £200 quality software, immaculate £130, Tel: 051-263 5626.
- Autoduel, Silent Service, Paint, Encounter, Centipede, many more! Tel: 0243 3736695.
- 800 XL, 1050 disk drive, 1010 tape deck, 1027 printer, Mini Office II, many magazines and discs. £275. Tel: 0270 663166
- 800XL, 1050 disc drive, XC11 and 1010 data recorders, 170 games on disc, ROM and cassette, joystick £200 O.N.O Tel: Canvey Island 0268 695935.
- Atari tape software for sale, worth £130 sell for £20. Write Andre, 67 St.Johns Walk, St.Ives, Cornwall.
- For sale 1029 printer as new with Mini Office II and Ten print £90 Tel: 0474 872715 evenings, buyer collects.
- Swap my 800XL for 850 interface. Wanted adventure writer manual Tel: Tamworth 250789 5pm-8pm.
- 1029, 1027, printer wanted fair price paid Tel: Essex 0268 794717.
- Wanted Frogger on ROM cartridge for XL Tel: Chesterfield 206582.
- Two 1050 disk drives, 1027 printer, 1010 recorder and a carrier bag full of software on disk, Rom and tapes. Package offer bargain at £350 Tel: Ipswich 0473 680292 any day.
- Collectors item. Atari User, first 36 copies plus folders mint condition. Offers. Tel: 0277 216112.
- 800 XL Computer house modified, 1050 drive, 850 interface, Pace Linnet modem, two joysticks, two mice, touch-tablet, lockable disk box, 48 disks, software galore, £300 O.N.O Tel: Jeff. Mellis 547.
- 800 XL 1050 drive, XC12. Lots software, mags, joysticks £200 O.N.O Tel: Owen 0603 880121.
- Atari 800 XL 256K disk drive, cass, printer and software £250 Tel: 061 6824165.
- For sale, 34 tape games most half price, includes Zybex, Druid, Arkanoid etc Tel: 01-4609187.
- 800XL 1010 tape, leads, joystick £100 games £80 O.N.O Tel: Burnley 0282 27087.
- 800XL, 1050 drive, joystick, over 30 discs. Worth £500, sell £280 O.N.O. 800XL, 1050 recorder, joystick, over 35 tapes. Worth £250, sell £130 O.N.O. Tel: David, Larkhall 0698 885252.
- Wanted 1050 disc drive. Reasonable price. Tel: 0273 834110.
- 800XL 256K RAM upgraded with O.S controller card £100 also Atari 800 with Axlon 288K RAM £80 Tel: Ian 0633 880714.
- 800 1050 disc drive, 850 interface, recorder, discs, ROMS, tape software, books and mags. All in good condition £220. Tel: 0925 828914.
- 800XL computer, Phonemark recorder two joysticks, 20 games £60 Tel: Johns 0362 81245.
- Atari 130XE, 1029 printer, 1050 drive, XC12 recorder, joysticks, games, mags, everything on tape/discs Tel: 0243 682489 £250 O.N.O.
- 800XL 1050 drive games + magazines £200 TEl: 061-3038171 O.N.O.
- Wanted 1050 disc drive, reasonable price. Tel: 0537 533232.
- 800XL, 1050 disc drive, 1010 recorder, OID 19" colour TV as monitor many cassettes and discs. £250 Tel: 0295 712173.
- Will swap Spectrum 48K with games and tape player for 1050 drive with instuctions and DOS disc. Contact: Simon Foley 15 Bay Gardens, Eastville Bristol.
- 800XL boxed and cover, 1010 recorder boxed, Atari writer cartridge, complete bound volumes 1 2 3 plus to August plus subscription expiring April 89. Atari User Magalinet, programming course Basic, Atari XL handbook with tape, other books, all as new, never used for games, ideal outfit for beginner, owner now business user £110 Tel: Kenilworth 512686.
- Atari 800, 1010 datarecorder, 20 games, 40 magazines (Atari User, C + VG) utilities, speech synthesiser £60 O.N.O David Tel:01-609 9768.
- Selection of 8 bit disc based software from £5 each including Ghostbusters, Eidolon, Pawn, Leaderboard, Flight Simulator II all originals with documentation Tel: 0606 871504 Evenings.
- Colossal, Snowball and Dungeon adventures (cassette) £4 each. The Slave (disc) £10. Mapping Atari not revised) £4. Writing strategy games £2. Computes first book £5. Basic (rev.a) cartridge £4. Tel: 031-3371641.
- Atari software all originals, various Rom cartridges, cassettes and discs. Tel: 0780 56117 (David) evenings.
- 800XL 800 48K 810 drive Archiver, 1050 drive, 1029 printer, 822 printer, WS2000 with Datacable 410 recorder, Trakball software, lots of Atari Users. Tel: David on 096 277 3360 Hampshire after 7pm.
- 800XL, 1010 recorder, 1050 disc drive, joy stick, software, mags, all boxed, excellent condition £175. Write Alan Wainwright, 122 Thirlmere Gardens, Northwood, Middx, HA6 2RS.
- Wanted 1050 disc drive in good condition any reasonable price considered. Tel: Hitchin (0462) 37866.
- 800XL, 1050, software, joystick, 4 roms, manuals £170. Books and tapes from £1-£5. Tel Pete 0536 710514 after 6.30pm.
- 800XL, 1050 disc drive, true double density discs £130. Tel: 0302 742151.
- Miracle Technology WS2000 modem, perfect condition £80. Tel: 0458 73425.
- 1029 printer, original box and manual £75. Tel: Stourbridge 395953.
- Atari 130XE, 800XL, 1050, 1010, blank memorex discs. Over £1500 worth of original software on cassette disc, 2nd cartridge plus disc box, cleaner and dustcovers. No splits £465. Tel: 04427 4568.
- Atari Mega ST4 + SC1224 monitor plus software, home and business computer, mint condition £900 o.n.o. Tel: Bradford 0274 542893 after 6pm cost £1600.

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10 words	£2.00
15 words	£3.00
20 words	£4.00
25 words	£5.00
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Cheque enclosed for £________

I certify that any software offered for sale is original and not a copy

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The American experience

NEIL FAWCETT takes a look at how American 8 bit users are faring compared to their UK counterparts

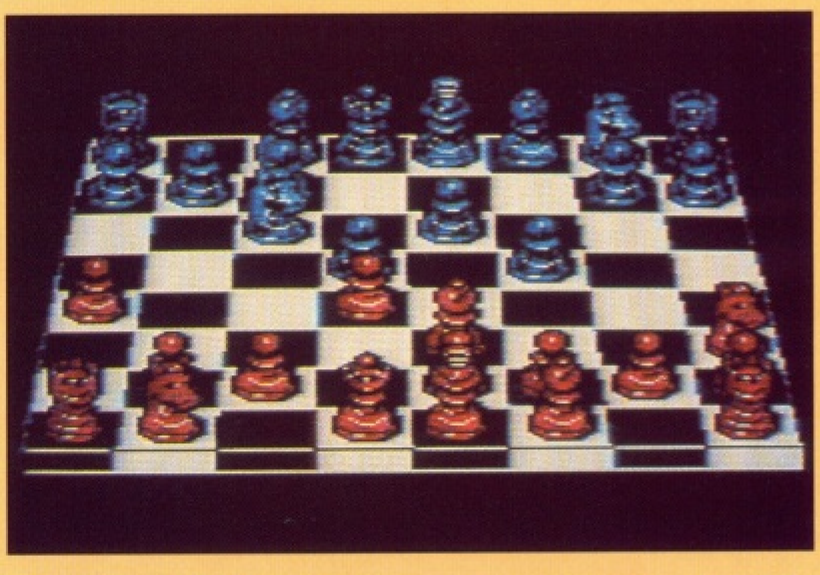
FOR a number of months we have been printing letters from concerned readers wondering what the future has in store for the Atari 8 bit market. Admittedly, several of the major software houses have stopped producing games, due to external pressures mainly directed from distributors who will not stock 8 bit products any more.

Apparently they feel the market isn't profitable enough for them to continue supporting. So, where does that leave the average 8 bit owner? How can he get the games he so desperately wants?

To whet your appetite let's take a look at some hardware and software products available in the USA and where possible give addresses and phone numbers of the distributors.

Some problems arise when buying hardware from the States and the major one concerns the voltage of US electrical equipment. In the UK we employ a 240 volt system, whereas the Americans use 115 volts. So if you buy an Indus GT disc drive as a replacement for your old 1050 you'll have problems. Also the British mains frequency is 50Hz but in the US it's 60Hz, which can upset timing circuits.

Luckily it's not too difficult to modify, or scratch build, your own power supply. And if this is too complicated a local electrical shop could do the job for a small fee, say around £20.



The superb 3D perspective created by Chessmaster

Hardware

If you would like to turn your Atari into the ultimate system, take a look at the BTL customised parallel interfaces. For those of you with an 800XL there is the BTL 2001 interface or the 2002 for XE systems: Both attach to the computer's parallel bus slot.

You can also buy the 2004 hard disc adaptor which attaches to a standard SASI hard disc controller. This will allow you to control one or two hard drives, giving a massive 128Mb of storage. BTL sells complete packages with up to 85Mb, or you can just buy the interface and controller and supply your own hard disc.

Prices? You can get a 10Mb system complete with MYDOS for $550 – that's around £395. But remember you will have to add postage, package and import duty.

For more information write to: William Lurie & Associates, P.O. Box 7546, Van Nuys, CA 91409. Or telephone 0101 818 780 1723.

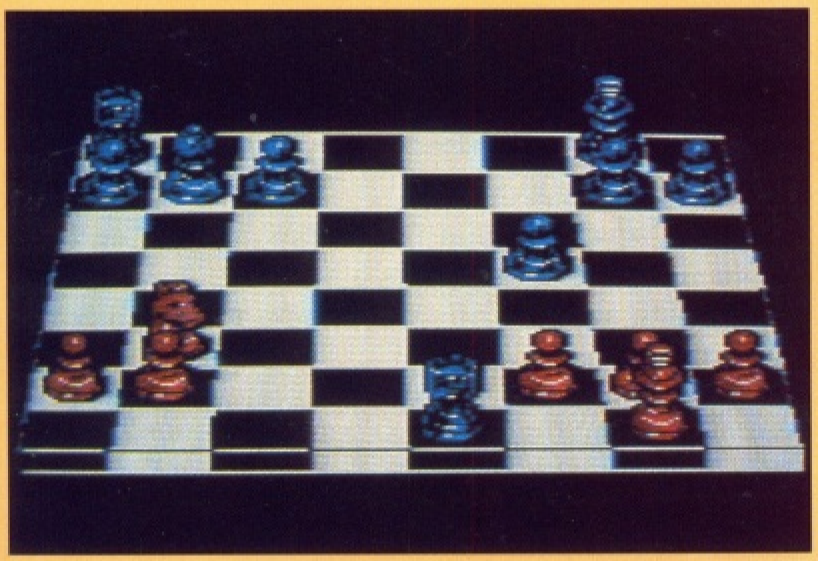
Atari has released the long awaited XEP-80 plug in 80 column video module. According to Atari it boasts a razor sharp text display, plugs into a joystick port and has its own Centronics parallel printer interface.

We took a look at the XEP-80 in the January 1987 issue of *Atari User* while it was under development. Unfortunately no software has been released to use the display it produces but we live in hope. One important factor to take into consideration is that you need a composite video monitor to view the display – it will not work on a TV or RGB monitor.

If you are interested in buying the XEP-80, get in touch with Silica Shop – 01-309 1111 – who sell it for £59.

Earlier I mentioned the Indus GT disc drive. I don't know too much about it except that it looks very sleek with its shiny black finish. Priced at $179 – around £128 – you can get more information from CMO, 477 East Third Street, Dept. B601, Williamsport, PA 17701 or you can ring them on 0101 1717 327 9575.

If you use your Atari as something more than a games machine, why not take a look at the Covox Voice Master. It allows you to digitally record and



Checkmate!

Turn to Page 42 ►

◀ *From Page 41*

manipulate your own voice.

For a cost of $89.95 (around £65) you get a small white box, headset, connecting cables, program disc and documentation.

Also included on the disc is a game of Blackjack – or Pontoon as we call it – which uses voice recognition to understand your commands.

Games

The games market in America seems as strong as ever. Over the years I have played several chess simulations on my Atari, but never have I seen one as good as Chessmaster 2000 by Electronic Arts. It offers a superb 3D perspective of the board and plays a really mean game.

As you can see from the screen shots, it's graphically superior to any other chess game you'll see on any 8 bit micro today. Packed with a multitude of features it will keep you happy for months. Priced at $25.99 (£19) you can get it from CMO – same address as for the Indus GT disc drive.

If you've bought the new XE Games System you will have received a free cartridge containing Flight Simulator II. Now Sublogic, the master of aircraft simulations, has brought out several new scenery discs which add to the enjoyment and playability of this superb program.

You have a number of choices, so I recommend you write to the Sublogic Corporation, 713 Edgebrook Drive, Champaign IL 61820 for more information on its products.

If you're into sport simulations you'll love World Karate Championship from Epyx. An excellent piece of music accompanies the superb graphical representation of the oriental martial arts. Fighting in several locations around the world you have to defeat your opponents in a flurry of moves before you can be crowned champion of the world.

There is a similar game already available – International Karate – but it doesn't appear to be the same as World Karate Championship. The music is different and I don't remember International Karate having as many locations.

Available from CMO again it retails at $18.99 (around £12). That's knockout value for a game of its quality.

MicroProse has put together a trio of its best-selling flight simulators on the Atari. Top Gunner gives you all the excitement of Hellcat Ace, Mig Alley Ace and Air Rescue. The first two are familiar to me but the last is a mystery.

Apparently you take the part of a chopper pilot who has to rescue a team of trapped archeologists in North Africa. A two dimensional third-person view is used to display the treacherous underground labyrinth. For more information write to MicroProse Software, 120 Lakefront Road, Hunt Valley, MD 21030 or telephone 0101 301 771 1151.

When contacting the companies mentioned above please tell them you read about the products in *Atari User*. You should allow up to a month for delivery of anything you order – overseas mail can be a pain at times.

● *Next month I'll take a look at some more products and hopefully show you a few screen shots of Infiltrator – an animated graphics adventure from Mindscape.*

Putting in a good word

THANK you for the superb article in the June 1988 issue of Atari User *about the foreign language tutorial programs for the Atari 8 bit. Unfortunately, they are only available on tape and I only had a 1050 disc drive.*

So after paying my local Atari dealer a visit, I bought an XC-12 cassette deck together with French and German language courses at a very reasonable price of £9.99 each.

They are wonderful value for money and a doddle to use – and the XC-12 is a very reliable cassette deck.

The reason I bought them is because I am in the process of taking a night school language course and felt I needed some extra practice with the oral side of learning a language. With the help of the Longmans tapes I have now improved my spoken French and German and can follow conversations in these two languages an awful lot better than before.

It was also nice to see that a woman had written the article. I would like to thank Ruth James and Longmans for the article and recommend the tutorials to everyone. – **Miss Sarah Smirthwaite, Aberdeen, Scotland.**

● It's always nice to hear from happy readers and we'll pass your comments on to the individuals concerned.

CLASSIFIED INFORMATION COMES IN USEFUL

AFTER seeing an advert in the classified section of Atari User *about somebody selling Atari hardware, I went round to see them. I was interested in buying the PR Connector by ICD because I was in the process of buying a Star LC-10 printer.*

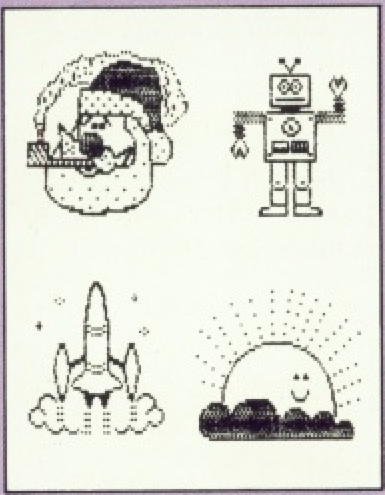
As well as this the advertiser was selling the Atari-Writer Plus program and Print Shop, which I thought was yet another word processor.

When I found out it was a graphic designer I was over the moon. It's just what I have always wanted but never knew existed.

Its features include making cards, letterheads, banners, kaleidoscopes and a facility to make your own symbols and logos.

I have never been so pleased with a program and I've had an 8 bit Atari computer for five years now. If I hadn't seen the advert and gone to see the person concerned I don't think I would ever have discovered this absolutely excellent program from Broderbund Software. – **Ben Sharpe, Emsworth, Hants.**

● Thanks for the letter Ben and for readers who haven't seen Print Shop in action here are some examples of what it can do:



ATARI USER

Faster than it seems

AT last, the XF-551 disc drive review we had all been waiting for. After all of the months Atari kept us waiting we were finally allowed to see an in-depth article about it.

However, after looking at the accompanying timing tables the drive seems to be identical to a standard 1050.

I thought that after all this time Atari could have pulled its finger out and done a good job. – **Graham Saunders, London.**

● If you take a close look at the review you will see a panel next to the timing tables which explains all. The Dos used for the review was a prototype and there was no way to switch the verify off when the drive was in write mode.

Because of this the results make the drive seem very slow, but believe us it is a superb machine and works an awful lot faster than the older 810 and 1050 drives.

Stealth is out

I WAS recently reading another computer magazine and I came across a review of Project Stealth Fighter by MicroProse. According to the magazine it is available for the Commodore 64 and Atari micros, but on the main MicroProse advert only the Commodore 64 version is mentioned.

I have also seen the manual for the game Gunship and there are loading instructions for the Atari XL/XE computers. So, now to my question: Where can they be found?

Moving away from games software, I'm glad to see Atari is advertising on TV and backing the 8 bit again. I certainly hope it will boost the sales of Atari micros. If this happens software houses may well resume writing programs for the best 8 bit computer.

Well done with the new look mag, I especially like the games reviews and the Gallup Chart. Keep up the good work. – **Stuart Ewen, Kirkintilloch, Glasgow.**

● Well Stuart you had quite a lot to say there. As to Stealth Fighter coming out on the Atari, they were probably referring to the ST version – and made a mistake by not putting ST after Atari.

MicroProse told us last time we contacted them that they were dropping their support of the 8 bit Atari.

Now on to the second game from them. Gunship appears to have been released in America for the 8 bit Atari according to several advertisers in American magazines. We'll try to get hold of one and report on it in our new series on American products.

And, yes, it is nice to see Atari supporting the 8 bit again!

Games galore

I HAVE come to the conclusion that some software houses have rejoined the land of the living. A few weeks ago I went to Bristol with my father to buy a new computer game with my pocket money.

We went into Virgin Games expecting to see a few crummy offerings on a shelf. When we saw four shelves packed with games we were amazed.

There were loads of new

Turn to Page 44 ▶

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titles I had never seen before. My dad gave me an extra £3 to go with my pocket money and I bought a pack of four games for £5.

So, all you other Atarians out there, get down to the Virgin Games store in Bristol – but don't buy them all because I still want a few. – **Kara Ball, North Bristol, Avon.**

Retrieving lost files

I WAS wondering if you could provide me with a solution to a little problem I have. I recorded another program over the end of Cavern Escape – from the May 1986 issue of Atari User.

The worst thing about it is that it has almost finished loading when it errors. Is there any way I can load what's left and then type in the missing lines? – **Peter Gibbs, Herne Bay, Kent.**

● Why not try the Recovery program we printed in the July 1988 issue of *Atari User*? It will read in as much of a damaged file as it can and re-save it for you.

A good Recovery

THANKS for the very good Basic Recovery program in the July 1988 issue of Atari User.

I have had two programs which failed to load for some time now. But after running them through the recovery program I managed to get at least 80 per cent of them back. It was a great relief I can tell you.

I enjoy your magazine and type in all of the cassette-orientated listings. – **L. Heppenstall, Heanor, Derbyshire.**

● We try our best to help all of our readers, Mr. Heppenstall. Thanks for the letter.

Compatible printers

COULD you please tell me if the Star LC-10 printer is compatible with the Atari XE computer systems? And could you also give me a list of other printers which are compatible with the 8 bit Atari? – **David Ponsonby, Buxton, Derbyshire.**

● The answer to your question is yes. The LC-10 is Epson-compatible and with the aid of an interface the Atari can be made to communicate to its Centronics parallel printer port.

The list of printers you could use is rather long, but here are a few: Panasonic KX-P1080, Epson FX-80, Epson LX-80, Epson LX-86, Epson LX-800, Epson LQ-1050, Citizen LSP-100, Star LC-10.

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Backing at last

£10 LETTER

WHAT a relief it was to me to read the news story in the August 1988 issue of Atari User *about Atari supporting the 8 bit in full.*

I had begun to worry about the future of my micro. I know I may sound biased when I say this, but my Atari 130XE is the best 8 bit micro ever to be designed, built and sold.

It's brilliant, stupendous but unfortunately underrated. It has been demeaned for its poor Basic and for the lack of support it has had over the years in the UK.

Usually when entering into a conversation of this nature with another computer owner – you know the types – BBC Micro, Commodore, Amstrad and so on – I begin to lose my temper.

But no more. I have recently obtained Turbo Basic – readily available in the public domain – and I am very impressed with it.

Not only is it a correctly structured programming language, it also has a compiler program which will compile TB files and old Atari Basic programs as well.

So with Atari backing the games scene and such a wonderful program as Turbo Basic available free, the future looks healthier – doesn't it? – **Stephen Pratt, Kingston-upon-Hull.**

● Hopefully Stephen this will be the start of better things for the Atari 8 bit micro. And maybe it will be given some credit for its quality and ahead-of-its-time design.

As to your reference to Turbo Basic, we at *Atari User* are interested to know how many of our readers have this superb programming language.

Switched cartridges

I HAVE a 130XE and constantly use the Mac 65, Basic XE and Action! cartridge-based languages. The wear and tear on these very expensive items caused by plugging and unplugging them is causing me some concern.

Recently you published two letters from other readers on the same subject. I would like to add my voice to theirs and ask you to come up with something that would hold all my cartridges and allow me to switch them in and out individually.

Such a gadget is available for the Commodore and it would be nice to see one for the Atari. – **D. Howell, Woolwich, London.**

● It appears that with the introduction of the new games console and the re-release of games on rom cartridge a device of this nature would be very useful. Peripheral manufacturers please note.

Saving to disc

IN the March 1988 issue of Atari User *there was a letter concerning Boulderdash Construction Kit on tape. It appears the writer was having problems saving newly-created levels to disc. Here is the solution:*

● *Turn on your disc drive, insert a Dos disc that you want to save the levels to and plug your cassette deck into the back of the drive.*

● *Load the game as normal. When it has loaded the screen will go blank and boot up Dos. The construction program will then run.*

You can now create your new levels and save them to disc using the cassette-based main program. – **Shek Cheung, Luton, Bedfordshire.**

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LVAR	Lists all the variables used by a program and shows you where they occur
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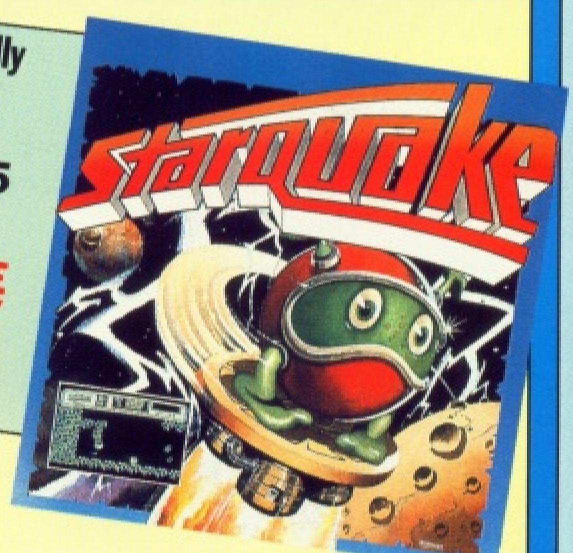
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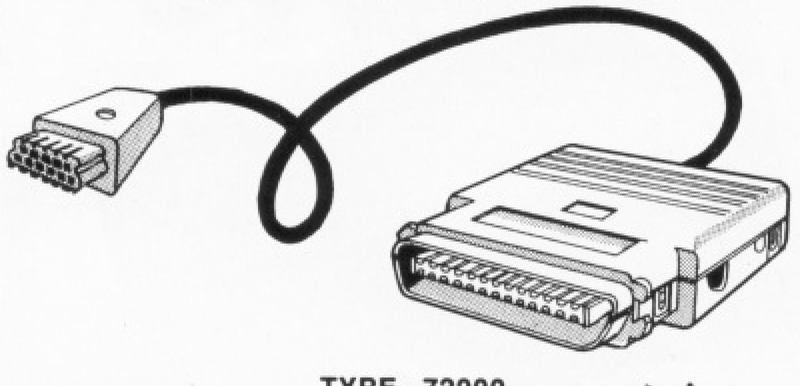
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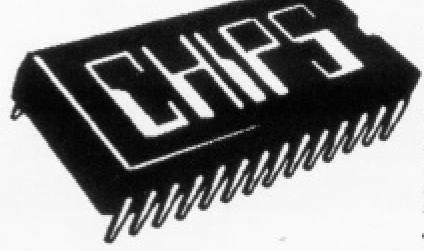
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AT9





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```
10 REM ************************
20 REM *    CAVERNS OF MALA     *
30 REM *     BY D.THOMSON       *
40 REM *    (c) ATARI USER      *
50 REM ************************
100 GRAPHICS 17:POSITION 4,10:? #6;"PL
EASE WAIT"
110 DIM A$(78),B$(11),MIS$(10),OFF$(10
)
120 MIS$="$$$$$$$$$$":OFF$="
"
130 REM REDEFINE CHARACTERS , PM GRAPH
ICS , TITLE SCREEN
140 GOSUB 1370:POSITION 4,10:? #6;"nea
rly done"
150 GOSUB 1100:GOSUB 2540:GOSUB 2440
160 SETCOLOR 4,0,0
170 SHIPS=6:LEVEL=1:SC=0
180 SETCOLOR 0,3,4:SETCOLOR 1,11,6:SET
COLOR 2,7,6
190 GOSUB 2540
200 GOSUB 1620
210 POKE 53277,3:X0=120:Y0=50:X2=60:X3
=180
220 MSHIP=980:FUEL=200:GUNS=820:BOMB=4
0:SHIPPOS=0
230 POKE PLL,8:POKE PLL+1,8:POKE PLL+2
,8:POKE PLL+3,8
240 IF LEVEL>=3 THEN GOSUB 1050
250 REM MAIN LOOP
260 POKE 705,FLASH:POKE 711,FLASH+14
270 FLASH=FLASH+7:IF FLASH>=245 THEN F
LASH=0
280 S=STICK(0):IF STRIG(0)<>0 THEN SOU
ND 3,0,0,0
290 SP=1:IF STRIG(0)=0 AND S<15 THEN S
P=3:SOUND 3,2,8,7
300 IF S<15 THEN POKE 77,0
310 IF S=14 THEN Y0=Y0-SP
320 IF S=6 THEN X0=X0+SP:Y0=Y0-SP
330 IF S=7 THEN X0=X0+SP
340 IF S=5 THEN X0=X0+SP:Y0=Y0+SP
350 IF S=13 THEN Y0=Y0+SP
360 IF S=9 THEN X0=X0-SP:Y0=Y0+SP
370 IF S=11 THEN X0=X0-SP
380 IF S=10 THEN X0=X0-SP:Y0=Y0-SP
390 IF S=15 THEN SP=0.25
400 IF Y0<=40 THEN Y0=40
410 IF X0<=48 THEN X0=48
420 IF X0>=200 THEN X0=200
430 POKE PLX,X0:POKE PLX+1,X0:POKE PLY
,Y0:POKE PLY+1,Y0
440 IF PEEK(53279)=3 THEN GOSUB 770
450 FUEL=FUEL-SP/2
460 POSITION 0,0:? #6;"fuel ";INT(FUEL
);" "
470 IF FUEL<=0 THEN 1920
480 POSITION 13,0:? #6;"ships ";SHIPS
490 REM COLLISION DETECTION
500 CRASH=PEEK(53252)
510 IF Y0=134 AND CRASH=2 THEN POSITIO
N 1,13:? #6;"  ":SOUND 0,10,3,5
520 IF Y0=123 AND CRASH=2 THEN POSITIO
N 16,17:? #6;"  ":SOUND 0,10,3,8
530 IF Y0=162 AND CRASH=2 THEN FUEL=FU
EL+10:SOUND 0,50,10,5
540 IF FUEL>=350 THEN FUEL=350:SOUND 0
,255,8,15
550 IF X0=142 AND CRASH=8 THEN POSITIO
N 11,19:? #6;" ":AL=1:SC=SC+50:GOSUB 6
60
560 IF X0=90 AND CRASH=8 THEN POSITION
 6,19:? #6;" ":AL=AL+1:SC=SC+50:GOSUB
660
570 IF Y0<=50 AND CRASH=8 AND AL=2 THE
N SC=SC+100:AL=0:GOTO 1770
580 IF PEEK(53260)>=4 THEN GOTO 1920
590 IF CRASH<>0 AND CRASH<>2 AND CRASH
<>8 THEN GOTO 1920
600 POKE 53278,0:SOUND 0,0,0,0
610 POSITION SHIPPOS,1:? #6;" ?xx} "
620 PAUSE=PAUSE+1:IF PAUSE=2 THEN GOSU
B MSHIP
630 IF LEVEL>=2 THEN WAIT=WAIT+1:IF WA
IT>10 THEN GOSUB GUNS
640 IF LEVEL=4 THEN GOSUB 700
650 GOTO 260
660 FOR A=0 TO 200 STEP 5
670 SOUND 0,A,10,10:NEXT A
680 RETURN
690 REM DROP BOMBS
700 BOMB=BOMB+6
710 O=RND(0)*10
720 POKE PLX+2,X2+O:POKE PLY+2,BOMB
730 POKE PLX+3,X3+O:POKE PLY+3,BOMB
740 IF BOMB>=210 THEN BOMB=40:X2=INT(R
ND(0)*140)+50:X3=INT(RND(0)*140)+50
750 SOUND 2,BOMB,10,1
760 RETURN
770 FOR S=0 TO 3:SOUND S,0,0,0:NEXT S
780 IF PEEK(53279)=6 THEN RETURN
790 IF PEEK(53279)=0 THEN POP :GOTO 18
90
800 GOTO 780
810 REM GUNS ON
820 SOUND 1,150,8,5
830 POSITION 1,12:? #6;MIS$
840 POSITION 12,19:? #6;MIS$(1,6)
850 POSITION 2,19:? #6;MIS$(1,4)
860 K=K+1:IF K=2 THEN K=0:GOTO 880
870 RETURN
880 WAIT=0:GUNS=900:RETURN
890 REM GUNS OFF
900 SOUND 1,0,0,0
910 POSITION 1,12:? #6;OFF$
920 POSITION 12,19:? #6;OFF$(1,6)
930 POSITION 2,19:? #6;OFF$(1,4)
940 OFF=OFF+1:IF OFF=2 THEN OFF=0:GOTO
 960
950 RETURN
960 WAIT=0:GUNS=820:RETURN
970 REM MOVE MOTHER SHIP
980 SHIPPOS=SHIPPOS+1:PAUSE=0
990 IF SHIPPOS=14 THEN MSHIP=1010
1000 RETURN
1010 SHIPPOS=SHIPPOS-1:PAUSE=0
1020 IF SHIPPOS=0 THEN MSHIP=980
1030 RETURN
1040 REM PLOT MINES
1050 FOR MINE=0 TO 30
1060 POSITION INT(RND(0)*20),INT(RND(0
)*7)+4
1070 ? #6;"{":NEXT MINE
1080 RETURN
1090 REM VERTICAL BLANK INTERRUPT
         ROUTINE MACHINE CODE
         ATARI USER MAGAZINE MAY 1987
1100 RESTORE 1230:FOR I=1536 TO 1706:R
EAD A:POKE I,A:NEXT I
1110 FOR I=1744 TO 1787:POKE I,0:NEXT
I
1120 PM=PEEK(106)-16:PMBASE=PM*256:POK
E 106,PM
1130 FOR I=PMBASE+1023 TO PMBASE+2047:
POKE I,0:NEXT I
1140 FOR I=PMBASE+1025 TO PMBASE+1032:
READ A:POKE I,A:NEXT I
1150 FOR I=PMBASE+1281 TO PMBASE+1288:
READ A:POKE I,A:NEXT I
1160 FOR I=PMBASE+1537 TO PMBASE+1544:
READ A:POKE I,A:NEXT I
1170 FOR I=PMBASE+1793 TO PMBASE+1800:
READ A:POKE I,A:NEXT I
1180 POKE 704,28:POKE 705,84:POKE 706,
14:POKE 707,20
1190 PLX=53248:PLY=1780:PLL=1784
1200 POKE 559,62:POKE 623,8:POKE 1788,
PM+4:POKE 53277,3:POKE 54279,PM
1210 X=USR(1696)
1220 RETURN
1230 DATA 162,3,189,244,6,240,89,56,22
1,240,6,240,83,141,254,6,106,141
1240 DATA 255,6,142,253,6,24,169,0,109
,253,6,24,109,252,6,133,204,133
1250 DATA 206,189,240,6,133,203,173,25
4,6,133,205,189,248,6,170,232,46,255
1260 DATA 6,144,16,168,177,203,145,205
,169,0,145,203,136,202,208,244,76,87
1270 DATA 6,160,0,177,203,145,205,169,
0,145,203,200,202,208,244,174,253,6
1280 DATA 173,254,6,157,240,6,189,236,
6,240,48,133,203,24,138,141,253,6
1290 DATA 109,235,6,133,204,24,173,253
,6,109,252,6,133,206,189,240,6,133
1300 DATA 205,189,248,6,170,160,0,177,
203,145,205,200,202,208,248,174,253,6
1310 DATA 169,0,157,236,6,202,48,3,76,
2,6,76,98,228,0,0,104,169
1320 DATA 7,162.6,160,0.32,92,228,96
1330 REM PM SHAPE DATA
1340 DATA 129,90,60,231,165,255,126,24
,0,0,0,24,90,0,0,0
1350 DATA 195,165,126,110,52,44,52,24,
165,165,255,173,52,110,52,24
1360 REM REDEFINE CHARACTER SET
1370 PMB=PEEK(106)-8:CHBASE=PMB*256:PO
KE 106,PMB
1380 POKE 16,64:POKE 53774,64
1390 RESTORE 1420
1400 FOR Z=0 TO 1023:POKE CHBASE+Z,PEE
K(57344+Z):NEXT Z
1410 FOR CHSET=CHBASE+3*8 TO CHBASE+58
*8+7:READ A:POKE CHSET,A:NEXT CHSET:PO
KE 756,PMB:RETURN
1420 DATA 255,255,127,63,63,31,15,3
1430 DATA 0,0,0,170,85,0,0,0,0,255,195
,181,173,195,255,0,0,56,108,215,171,21
5,236,124,0,28,54,235,213,235,55,62
1440 DATA 129,231,239,255,255,255,255,
255,255,255,255,255,255,255,221,137,19
2,224,224,240,240,248,254,255
1450 DATA 1,7,31,63,63,63,127,255,164,
238,255,252,254,255,239,102,133,221,25
5,255,255,255,239,73
1460 DATA 0,0,0,0,24,56,56,0,254,255,2
54,252,254,252,216,128,62,99,103,111,1
19,103,62,0
1470 DATA 24,56,24,28,28,28,126,0,127,
```

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```
99,3,14,120,112,127,0,127,99,3,31,7,10
3,127,0
1480 DATA 96,102,102,127,14,14,14,0,12
7,96,126,7,7,103,127,0,62,48,48,127,11
5,115,127,0
1490 DATA 127,3,6,28,28,28,28,0,62,54,
54,127,115,115,127,0,126,102,102,127,7
,103,127,0
1500 DATA 254,252,248,252,254,252,254,
255,255,127,63,127,255,63,127,63,0,0,3
6,24,24,36,0,0
1510 DATA 255,255,255,255,255,255,255,
255,0,240,156,235,235,156,240,0,0,15,5
7,215,215,57,15,0
1520 DATA 37,119,255,63,127,255,247,10
2,126,102,102,119,127,119,119,0,124,10
2,102,127,119,119,126,0
1530 DATA 63,115,112,112,96,99,63,0,12
6,103,103,103,99,99,126,0,63,48,48,124
,112,112,127,0
1540 DATA 63,48,48,124,112,112,112,0,6
2,50,48,112,119,115,127,0,51,51,51,127
,119,119,119,0
1550 DATA 12,12,12,28,28,28,28,0,60,12
6,227,239,231,239,239,255,51,51,54,124
,124,118,115,0
1560 DATA 48,48,48,112,112,112,127,0,9
9,119,127,107,99,103,103,0,51,51,59,12
7,119,115,115,0
1570 DATA 62,35,99,103,103,103,62,0,62
,51,51,115,126,112,112,0,0,60,102,219,
231,189,36,126
1580 DATA 62,51,51,115,126,118,115,0,1
26,102,96,127,7,103,127,0,127,24,24,28
,28,28,28,0
1590 DATA 99,99,99,103,103,103,126,0,1
15,115,115,99,103,62,28,0,115,115,99,1
07,127,119,99,0
1600 DATA 165,255,219,165,219,189,219,
0,99,99,54,28,12,28,28,0,0,24,36,90,23
1,219,126,36
1610 REM MAIN SCREEN
1620 POSITION 0,12
1630 ? #6;"              █         q ";
1640 ? #6;"(%%----*q +)----((=(";
1650 ? #6;":          #)-/      #)==";
1660 ? #6;"=*                         #=";
1670 ? #6;"=: +-(*      +(((*      ;";
1680 ? #6;"==-/ #)(*j+)))==%%-=";
1690 ? #6;"=/         #==/    #/     ;";
1700 ? #6;":█      █+))*█          █;";
1710 ? #6;"=:   @(=/   #=(*       ;=";
1720 ? #6;"=:     #/       #))-,   ;=";
1730 ? #6;"==*        +*           +==";
1740 ? #6;"===((((==((((((===";
1750 REM DOCKING TUNE
1760 RETURN
1770 FOR A=0 TO 3:SOUND A,0,0,0:NEXT A
:RESTORE 1870
1780 READ C.E
1790 IF C=0 AND E=0 THEN 1890
1800 GOSUB 1810:GOTO 1780
1810 SOUND 0,C,10,15:FOR D=0 TO 10:NEX
T D
1820 SOUND 1,C+1,10,15
1830 POKE 20,0
1840 A=PEEK(20)
1850 IF A<E THEN 1840
1860 SOUND 0,0,0,0:SOUND 1,0,0,0:RETUR
N
1870 DATA 72,30,64,30,81,30,162,30,108
,50,0,0
1880 REM LEVEL COMPLETE
1890 POKE 53277,0:POKE 53278,0
1900 LEVEL=LEVEL+1:GOTO 1960
1910 REM SHIP DESTROYED
1920 POKE 53277,0:POKE 53278,0
1930 SHIPS=SHIPS-1:FUEL=0
1940 FOR A=0 TO 15:SOUND 1,A*10,8,15:S
OUND 2,A*10+2,P,15
1950 SETCOLOR 4,A,7:NEXT A
1960 GOSUB 2540
1970 REM SCORE
1980 FOR S=0 TO 3:SOUND S,0,0,0:NEXT S
:SETCOLOR 4,0,0
1990 SC=SC+INT(ABS(FUEL))
2000 IF SHIPS=0 THEN 2200
2010 IF LEVEL=5 THEN 2170
2020 POSITION 2,4:? #6;"SCORE..... ";S
C
2030 POSITION 2,8:? #6;"SHIPS LEFT...
";SHIPS
2040 POSITION 2,12:? #6;"LEVEL.......
";LEVEL
2050 POSITION 4,19:? #6;"press fire"
2060 FOR C=0 TO 15:SETCOLOR 0,C,C:SETC
OLOR 1,C+4,C
2070 IF STRIG(0)=0 THEN SETCOLOR 4,0,0
:GOTO 2110
2080 SOUND 1,C*4,10,4
2090 SOUND 0,C*4+10,10,4
2100 NEXT C:GOTO 2060
2110 GOSUB 2540
2120 SOUND 0,0,0,0:SOUND 1,0,0,0
2130 POKE PLX.120:POKE PLX+1.120:POKE
PLY,50:POKE PLY+1,50
2140 IF LEVEL=4 THEN POKE PLX+2,80:POK
E PLY+2,50:POKE PLX+3,160:POKE PLY+3,5
0
2150 GOTO 180
2160 REM ALL SHIP DESTROYED
2170 POSITION 0,1:A$="CONGRATULATIONS.
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	CP1 (Y)	500	8QV (T)	950	RTE (V)
20	CP2 (3)	510	WE2 (6)	960	MND (M)
30	CP3 (X)	520	07P (N)	970	DR1 (J)
40	CP4 (4)	530	6AW (W)	980	48R (P)
50	CP5 (Y)	540	OHC (8)	990	YDH (K)
100	TN9 (G)	550	9LD (M)	1000	VAK (Q)
110	S47 (D)	560	RAF (O)	1010	686 (L)
120	HTV (Y)	570	LEP (Q)	1020	WVQ (L)
130	D7S (H)	580	5R8 (G)	1030	VHK (P)
140	Q11 (Y)	590	GC9 (S)	1040	D6N (J)
150	5U4 (W)	600	RNA (3)	1050	E4E (4)
160	5DA (O)	610	RDD (4)	1060	PMC (P)
170	C1A (8)	620	VL6 (M)	1070	F13 (W)
180	ON8 (5)	630	156 (W)	1080	VTK (T)
190	QEJ (L)	640	T6L (5)	1090	DHN (X)
200	P7K (2)	650	R1D (K)	1100	F4J (X)
210	CTV (7)	660	7NO (W)	1110	H7U (G)
220	349 (S)	670	DT2 (A)	1120	QV3 (9)
230	F1A (M)	680	S6A (1)	1130	4HA (K)
240	X9F (1)	690	DYX (D)	1140	DTD (8)
250	DGT (F)	700	WCM (7)	1150	EDD (L)
260	2HT (S)	710	PWY (T)	1160	EHD (8)
270	W1C (5)	720	FR8 (2)	1170	EPD (H)
280	M90 (R)	730	FVS (U)	1180	XGU (4)
290	66Q (X)	740	8QT (2)	1190	WS6 (D)
300	JTC (Y)	750	3OY (W)	1200	YCM (5)
310	C40 (G)	760	RXC (H)	1210	VDM (G)
320	T76 (6)	770	E9E (P)	1220	VPK (C)
330	86K (4)	780	Q8Q (R)	1230	FOE (8)
340	TAX (Q)	790	8T4 (C)	1240	A53 (P)
350	CJR (V)	800	R5F (J)	1250	K7Q (J)
360	U3F (R)	810	DOO (P)	1260	NE4 (1)
370	CJH (T)	820	YHV (5)	1270	D9T (9)
380	5WN (A)	830	RRW (7)	1280	AYC (K)
390	DN8 (5)	840	WAU (A)	1290	DGK (A)
400	ALL (A)	850	UNX (E)	1300	KL3 (6)
410	AU1 (Q)	860	5S9 (6)	1310	OEP (6)
420	JKD (9)	870	S2D (4)	1320	SK3 (V)
430	HTH (G)	880	MND (A)	1330	DHN (U)
440	OOY (D)	890	EOO (9)	1340	M85 (C)
450	5F8 (V)	900	PCW (J)	1350	4SH (T)
460	NN1 (A)	910	PVY (K)	1360	DPN (V)
470	EVN (J)	920	UVX (W)	1370	RD9 (M)
480	QJF (8)	930	STO (S)	1380	N25 (H)
490	DYV (7)	940	P5V (X)	1390	YHU (L)

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1400	AKC (5)	1850	8G2 (P)	2300	NV1 (Q)
1410	6N9 (H)	1860	8UL (1)	2310	KN8 (X)
1420	R5F (C)	1870	6VG (F)	2320	XFW (O)
1430	77R (2)	1880	EFN (F)	2330	GKQ (P)
1440	RFQ (4)	1890	NES (7)	2340	GGN (C)
1450	EJT (Y)	1900	SFA (G)	2350	VGA (X)
1460	5Y5 (8)	1910	E4N (E)	2360	YEY (L)
1470	YWV (Y)	1920	N3S (6)	2370	2SG (4)
1480	57Q (H)	1930	FRR (8)	2380	52R (5)
1490	5A4 (7)	1940	WLT (Q)	2390	GCC (O)
1500	9KU (J)	1950	NS1 (V)	2400	D7D (O)
1510	GF9 (8)	1960	TVH (J)	2410	VLP (5)
1520	T2F (K)	1970	EHN (K)	2420	PQE (E)
1530	AYV (Q)	1980	CXM (L)	2430	DMP (A)
1540	A2U (J)	1990	FR9 (H)	2440	57V (9)
1550	DUD (1)	2000	G5S (J)	2450	VA7 (2)
1560	FDX (D)	2010	G80 (C)	2460	21K (7)
1570	EHU (X)	2020	9GA (G)	2470	3A3 (F)
1580	5SS (C)	2030	OU9 (S)	2480	TCX (6)
1590	JSM (J)	2040	VT7 (7)	2490	TMV (H)
1600	3L5 (L)	2050	XQU (X)	2500	O5C (4)
1610	DRN (P)	2060	4XG (4)	2510	TKD (4)
1620	6N5 (O)	2070	W9R (A)	2520	YN2 (7)
1630	9A8 (K)	2080	5LK (3)	2530	7WF (U)
1640	LP2 (A)	2090	67S (4)	2540	YEH (K)
1650	AFR (C)	2100	47H (L)	2550	58F (X)
1660	9JH (3)	2110	SKJ (R)	2560	DXP (R)
1670	DU2 (3)	2120	M52 (Y)	2570	OUR (D)
1680	S3X (U)	2130	FAO (6)	2580	3KJ (W)
1690	DR8 (8)	2140	T5V (Q)	2590	OQ9 (Q)
1700	9FH (H)	2150	P4W (D)	2600	FH6 (4)
1710	FKX (C)	2160	DFP (8)	2610	DT3 (R)
1720	F4T (N)	2170	SE6 (8)	2620	5UN (L)
1730	AQH (V)	2180	PLE (O)	2630	3JU (P)
1740	GH8 (Y)	2190	DMP (7)	2640	796 (O)
1750	E4N (U)	2200	TVU (6)	2650	D8X (S)
1760	WKK (V)	2210	9PK (C)	2660	W7W (K)
1770	98X (C)	2220	1QW (9)	2670	J82 (K)
1780	R5C (U)	2230	3G3 (7)	2680	W60 (F)
1790	N6S (5)	2240	8WH (R)	2690	Q3M (L)
1800	EE7 (F)	2250	8R8 (E)	2700	5EH (7)
1810	4NR (J)	2260	Y56 (P)	2710	XS2 (Q)
1820	6L7 (A)	2270	SDS (S)	2720	O3H (G)
1830	Q28 (T)	2280	S56 (R)	2730	908 (8)
1840	W4P (P)	2290	EC4 (Y)	2740	WFL (D)

```
... YOU HAVE DESTROYED  ALL 8 SHIPS AN
D THE EARTH IS NOW SAFE.":GOSUB 2710
2180 GOTO 2210
2190 REM FAILED TO DESTROY ALL SHIPS
2200 POSITION 0,1:A$="YOU HAVE FAILED
AND THE EARTH WILL NOW  BE DESTROYED..
....":GOSUB 2710
2210 IF LEVEL=1 THEN B$="granny"
2220 IF LEVEL=2 THEN B$="space cadet"
2230 IF LEVEL=3 THEN B$="space pilot"
2240 IF LEVEL=4 THEN B$="captain"
2250 IF LEVEL=5 THEN B$="admiral"
2260 POSITION 6,7:? #6;"RANKING"
2270 POSITION (19-LEN(B$))/2,9
2280 ? #6;B$
2290 IF SC>HI THEN HI=SC
2300 POSITION 2,13:? #6;"last score ";
SC
2310 POSITION 4,15:? #6;"hiscore ";HI
2320 POSITION 0,20:? #6;"PRESS START T
O PLAY"
2330 POSITION 3,22:? #6;"OPTION TO END
"
2340 FOR A=255 TO 5 STEP -5
2350 SOUND 0,A,8,15:SOUND 0,A-5,8,15
2360 NEXT A:SOUND 0,0,0,0:SOUND 1,0,0,
0
2370 FOR C=0 TO 15
2380 IF PEEK(53279)=6 THEN GOSUB 2540:
POKE PLX+2,0:POKE PLX+3,0:SOUND 1,0,0,
0:GOTO 160
2390 IF PEEK(53279)=3 THEN GRAPHICS 0:
END
2400 SETCOLOR 0,C,C:SETCOLOR 1,C+4,C:S
ETCOLOR 2,C+8,C:SETCOLOR 3,C+12,C
2410 SOUND 0,C+200,10,15:SOUND 1,C+240
,10,15:NEXT C
2420 GOTO 2370
2430 REM TITLE SCREEN
2440 SETCOLOR 0,1,12:SETCOLOR 1,7,8:SE
TCOLOR 2,0,15:SETCOLOR 3,3,8
2450 POSITION 2,4:? #6;"caverns of nal
a"
2460 POSITION 9,10:? #6;"by"
2470 POSITION 5,12:? #6;"D.THOMSON."
2480 POSITION 8,14:? #6;"1988"
2490 POSITION 0,19:? #6;"press start t
o play"
2500 POSITION 2,21:? #6;"PRESS SELECT
FOR       INSTRUCTIONS."
2510 IF PEEK(53279)=6 THEN GOSUB 2540:
RETURN
2520 IF PEEK(53279)=5 THEN GOSUB 2540:
POP :GOTO 2570
2530 TE=TE+1:SETCOLOR 3,TE,8:GOTO 2500
2540 FOR C=0 TO 23:POSITION 0,C:? #6;"
                    ";:REM 20 SPACES
2550 NEXT C:RETURN
2560 REM INSTRUCTIONS
2570 POSITION 0,1:SETCOLOR 4,1,12:SETC
OLOR 0,0,0
2580 A$="ON THE PLANET NALA  THERE ARE
8 SHIPS   THAT CAN DESTROY THE":GOSUB
2710
2590 POSITION 0,4
2600 A$="EARTH. YOUR MISSION IS TO DES
TROY THE   SHIPS. TO ENTER THE ":GOSUB
2710
2610 A$="CAVERNS DOCK WITH   THE TOWER
S ON THE   SURFACE THESE WILL  ":GOSUB
2710
2620 A$="THEN OPEN THE GATES.REFUEL BY
LANDING ONTHE FUEL DUMP AND   ":GOSUB
2710
2630 A$="DESTROY THE SHIP BY TOUCHING
THE SIDES. AFTER DESTROYING THE":GOSUB
2710
2640 POSITION 0,16
2650 A$="SHIPS RETURN TO THE CENTER OF
THE MOTHERSHIP. PRESS FIRE TO INCREAS
E SPEED.":GOSUB 2710
2660 POSITION 2,22:A$="option to pause
":GOSUB 2710
2670 POSITION 3,23:A$="start to play":
GOSUB 2710
2680 FOR C=0 TO 15:SETCOLOR 1,C,7
2690 IF PEEK(53279)=6 THEN GOSUB 2540:
GOTO 160
2700 NEXT C:GOTO 2680
2710 FOR N=1 TO LEN(A$):FOR Z=1 TO 10:
NEXT Z
2720 SOUND 1,100,10,12:? #6;A$(N,N);
2730 SOUND 1,0,0,0:NEXT N
2740 RETURN
```

Your HINTS & TIPS

ONE of the most popular adventures to come out of the Infocom stable is Mindshadow. Our trusty cartographer Bryan Stevens, of Andover, Hants, who spent many hours drawing the map on the facing page, was surprised at just how easy the adventure is to complete when you tumble to one all-important fact.

Unfortunately, he wasn't willing to disclose it, even though offered a bribe of a year's free subscription to *Atari User*.

Now on to Bryan's complete solution. Remember that once you have used something you should drop it, because you can only use each item once.

THE ISLAND

- Go N, E, E and get vine.
- Go W, W, S, E and tie vine to rock.
- Go down, W, get rock, dig ground and get the steel.
- Go West and enter the hut before you get the straw.
- Go S, N, N, E, N, E, E, S, S, E and get the rum.
- Go W, N, N, W, W, S, W, S, S, S and get the shell.
- Drop the straw, hit the rock with the steel and give the rum.

THE SHIP

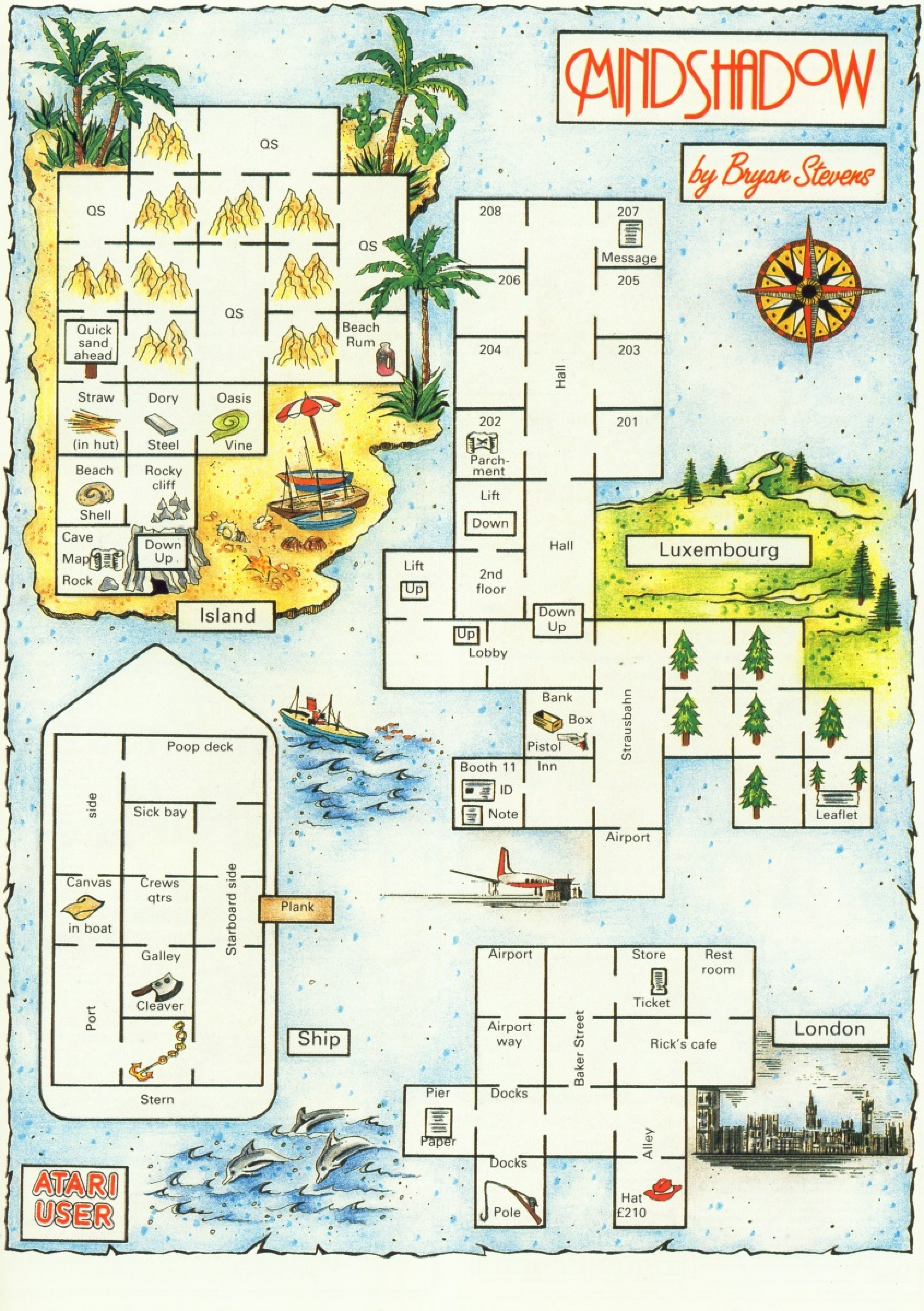
- Go N, W and talk to the doctor. Then think gash.
- Go S and hit the man.
- Go S again and get the cleaver.
- Go N, N, E, N, W, S and get the canvas. Now wear it.
- Go S, E and cut the chain with the cleaver.
- Go E, N, N, E and enter the boat.

LONDON

- Go E, E, E, S and search the man before you get the hat.
- Go N, W, N, E and give the hat.
- Go E and examine the drink. Follow the man and think tycoon.
- Go S, W and get the hat. Now examine it.
- Go W, S, W, S and buy the pole.
- Go N, W to the fish debris and read the newspaper. Now think Arcman.
- Go E, N and pay the man.
- Go S, E, N, N, E and buy the ticket. Type Chandralt and buy the ticket.
- Go W, S, S, W, N, N and enter the plane.

LUXEMBOURG

- Go N, E and enter booth 11. Search the man and get his ID. Read it and think Bob.
- Get the note and read it. Now think Jared.
- Go E, E, N, E, E, S, E and dig. Get the leaflet and read it.
- Go W, N, W, W, W and talk to the clerk. Get the box and examine it before you get the gun.
- Give the box and go E, N, W. Now go up then N, W and get the parchment. Now read it.
- Go E, N, N, N, E and shoot the man. Then think William. And that's all there is to it.


MINDSHADOW
by Bryan Stevens
QS
QS
QS
QS
Quick sand ahead
Beach Rum
Straw (in hut)
Dory Steel
Oasis Vine
Beach Shell
Rocky cliff
Cave Map Rock
Down Up
Island
208
207 Message
206
205
204
203
Hall
202 Parch-ment
201
Lift Down
Hall
Luxembourg
Lift Up
2nd floor
Down Up
Up Lobby
Bank Box Pistol
Strausbahn
Booth 11 ID Note
Inn
Leaflet
Airport
Poop deck
side
Sick bay
Canvas in boat
Crews qtrs
Starboard side
Plank
Galley Cleaver
Port
Stern
Ship
Airport
Store Ticket
Rest room
Airport way
Baker Street
Rick's cafe
London
Pier Paper
Docks
Docks Pole
Alley
Hat £210
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